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# FROZEN FOOD LOCKER PLANTS IN THE UNITED STATES

JANUARY 1, 1941

By

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By

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Frozen food lockers, which were practically unknown during the first World War, now occupy an important place in the food preservation system used by farmers. Approximately 3,200 plants, serving more than a half million families, almost three-fourths of them farmers, were operating in 44 States on January 1, 1941.

During the twenties, a few creameries, ice plants, and cold storage companies were renting individual compartments in low-temperature rooms to people who wished to store game, meats, and fruits. Most of these units were

located in the States of Washington, Oregon, Kansas, Nebraska, and California.

Development was slow during these early years. Available records indicate that there were probably not more than 250 plants furnishing locker service at the end of 1935. Washington with 64 plants had the largest number of units at that time, while Oregon, Iowa, California, Kansas, Idaho, and Nebraska followed in that order with from 16 to 25 plants. Other States with from 2 to 5 plants were Minnesota, Missouri, New York, Pennsylvania, North Dakota, South Dakota, Utah, Oklahoma, Colorado, and Wisconsin (see fig. 1).

During the middle thirties a marked change in the development took place. Instead of making each patron responsible for chilling, cutting, and wrapping his own meats and putting these and other products directly into the locker, many new plants provided sharp freezers, chill rooms, and in addition cutting, grinding, wrapping, and handling services at the plant.

An increasing number of plants also installed facilities for curing and smoking hams and bacon, rendering lard, making sausage, slaughtering, and blanching vegetables. Furthermore, many plants were designed and built especially to render these services. These changes in the type and amount of service rendered, combined with the information made available through research and the interest of educational workers in the fields of nutrition and economics, were the main forces behind the phenomenal expansion of the locker industry during the late thirties.

Operators' reports indicate that between 150 to 200 plants were opened during 1936. Iowa led in this expansion with Washington, Oregon, Idaho, Nebraska, Wisconsin, Kansas, and Minnesota following in that order (see fig. 2). During 1937 more than 350 plants were opened, with one or more plants reported in 30 States.

During 1938 between 550 and 650 plants were opened. According to the available records, Iowa led the expansion with more than 100 plants. Minnesota, Wisconsin, Washington, and Illinois opened between 50 and 100 each, and in each of 23 other States one or more plants went into operation.

Although the rate of expansion decreased in some of the leading States during 1939, the rate for the United States as a whole was maintained at the same level. Such States as Texas, Tennessee, Pennsylvania, Michigan, Indiana, Arkansas, and Alabama were opening plants at a much more rapid rate than during 1938 (see fig. 5).

Figure 7, which combines all installations recorded including those which have not reported the year in which they were opened, indicates that some States, particularly Iowa, Minnesota, Wisconsin, Nebraska, Kansas, Washington, Oregon, and Idaho, have probably reached a near-saturation point in terms of plant numbers in rural areas. Further, certain rural areas in other States display an excellent locker plant coverage. On the other hand, there are many States in which the industry is still in its infancy.

Many factors will determine the extent of expansion in rural areas during the next 5 years. Expansion can be measured in a number of ways: First, number of plants; second, total capacity of all plants; and third, locker use. Locker use will, in the long run, determine the other two. Farmer usage, which to date is all-important, will be determined by a number of factors, most important of which are: First, the extent to which the locker system of processing and preservation is an improvement over the other methods of storing and preserving home-grown foods and the farmers' understanding and appreciation of this improvement; second, the cost and convenience of the service as compared to home processing and preservation of the foods which they have been in the habit of preserving on the farm; and third, the net cost of the foods procured and processed in this manner as compared to those which otherwise would be purchased at retail.

These factors, combined with possible changes in the cost of retailing and improvements in this and other food processing or handling techniques, will determine the ultimate future use of locker plants. Still another possibility is the development of the home frozen-storage units in such sizes and volume and at prices which will make them worthy competitors of the lockers. All these and a number of other factors need to be given serious consideration by present and prospective operators.



Figure 1

Frozen Food Locker Plants Opened during,  
or prior to, 1935

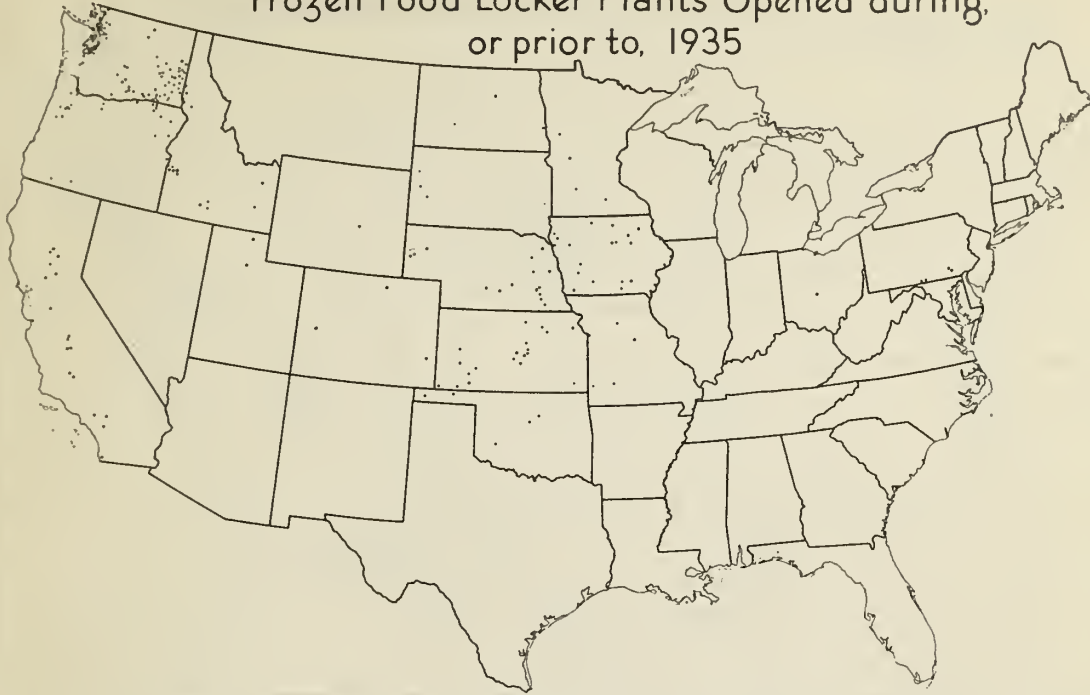


Figure 2

Frozen Food Locker Plants Opened during 1936



Figure 3

Frozen Food Locker Plants Opened during 1937

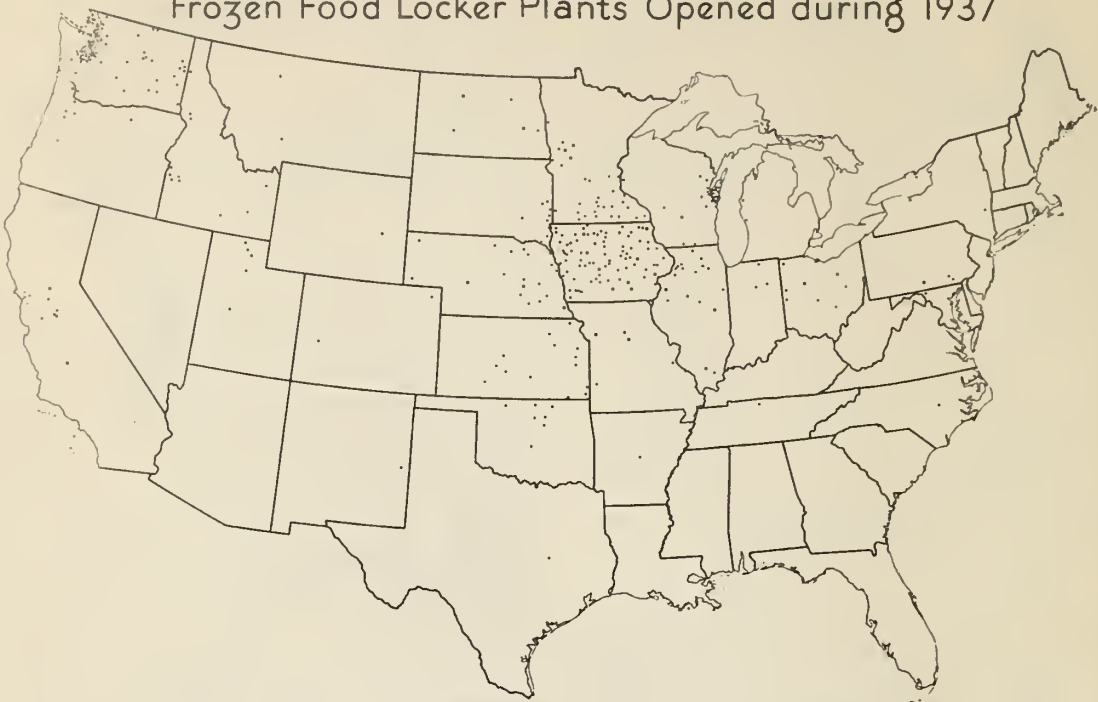


Figure 4

Frozen Food Locker Plants Opened during 1938

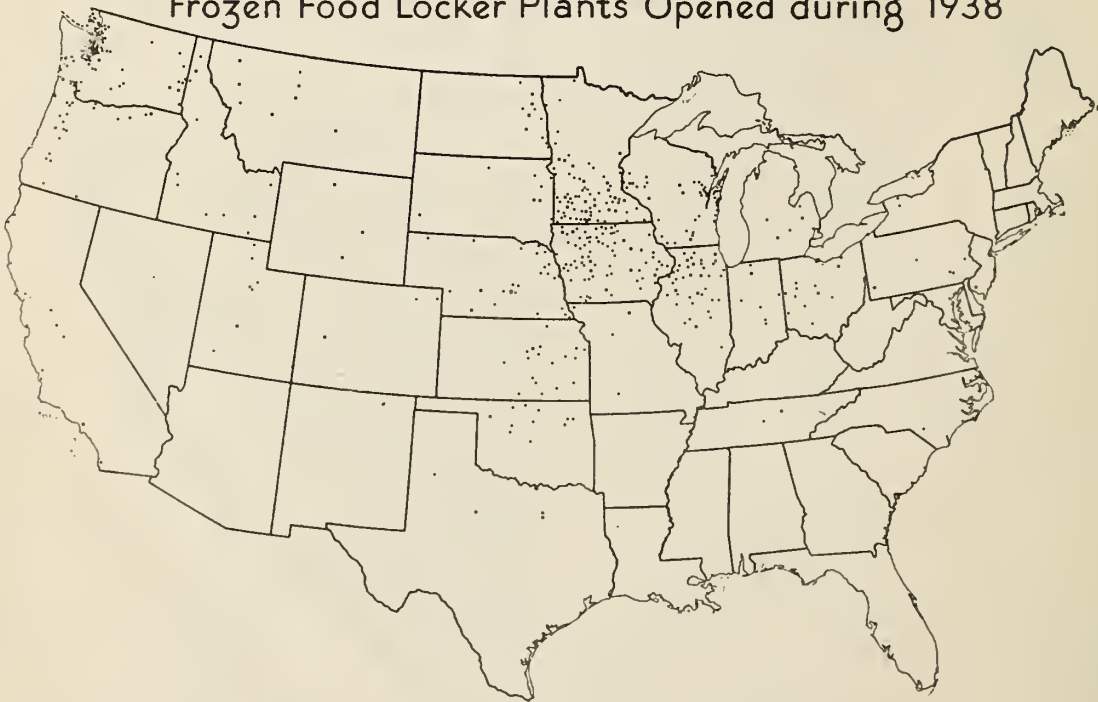




Figure 5

Frozen Food Locker Plants Opened during 1939

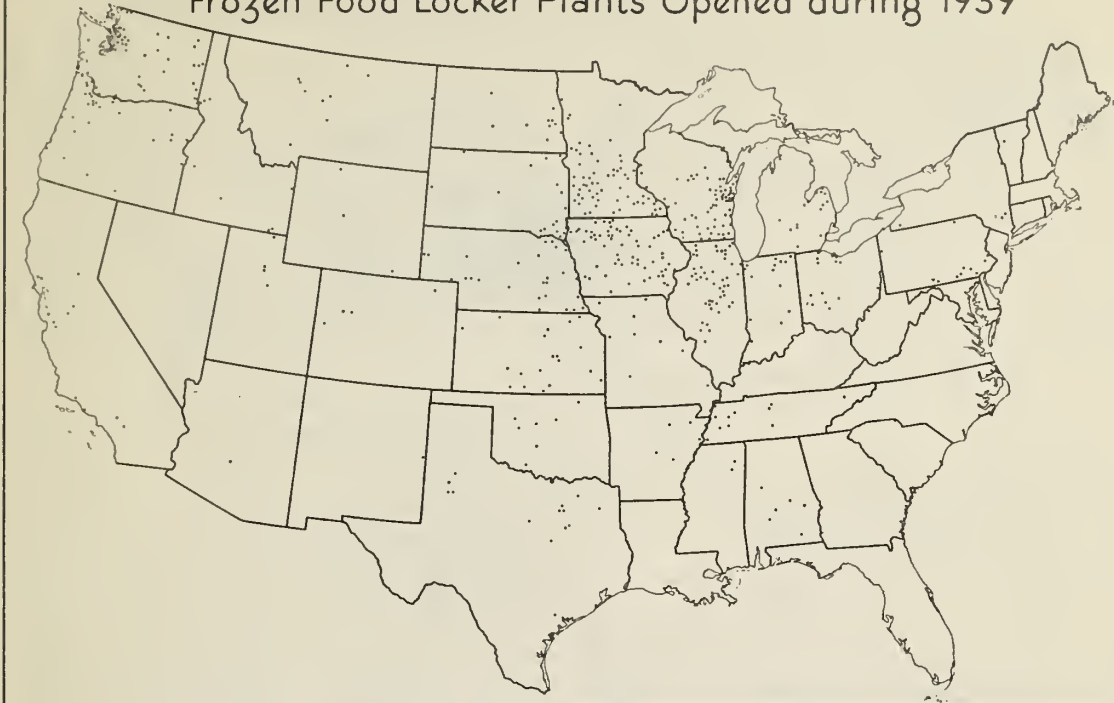


Figure 6

Frozen Food Locker Plants Opened during 1940

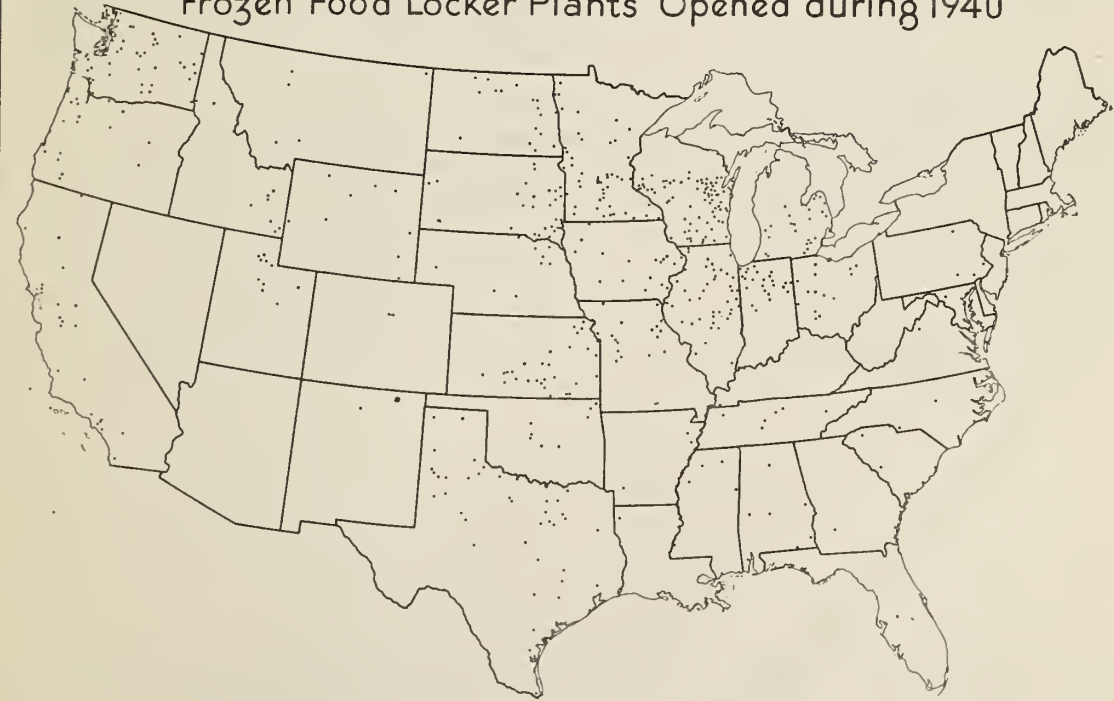
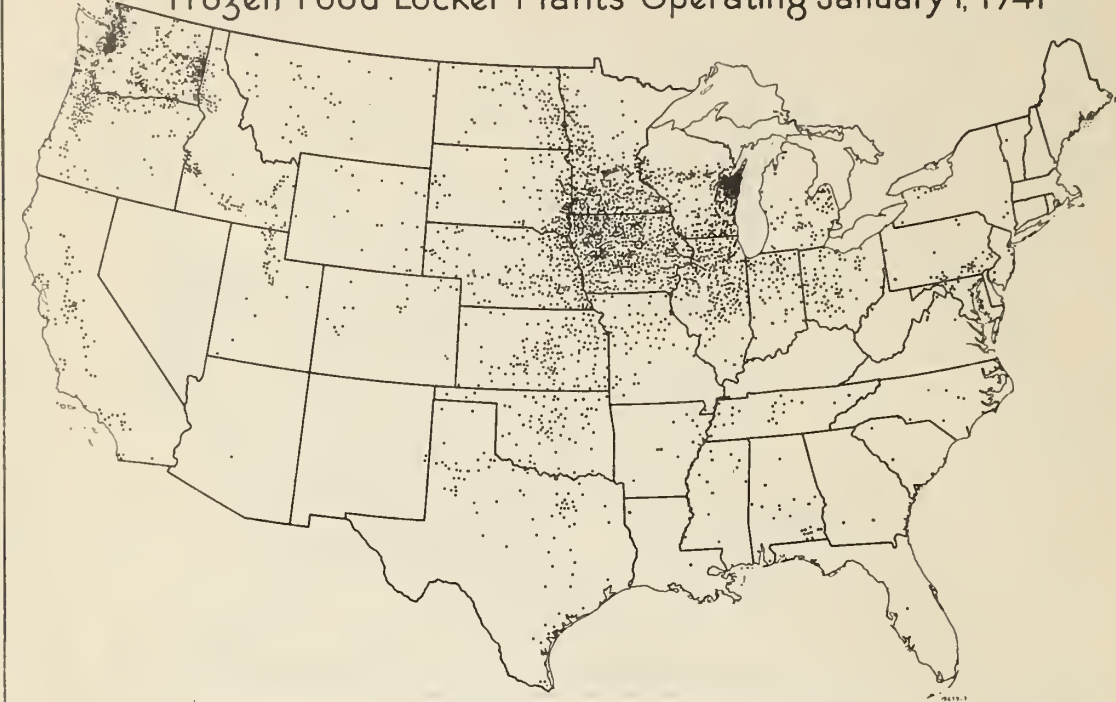


Figure 7

Frozen Food Locker Plants Operating January 1, 1941



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## SCOPE AND OBJECTIVES

In order to present a reasonably accurate picture of the development in the United States to date, the Cooperative Research and Service Division of the Farm Credit Administration, with the cooperation of the operators, the national and state locker associations, and the colleges of agriculture, made its second survey of the industry during the spring of 1941.<sup>1</sup>

In addition to the information on size, rentals, ownership, affiliation, size of town, patronage, rental and service rates compiled from reports in the 1940 survey, the 1941 questionnaire included questions on the quantity of pork products cured and the quantity of local fruits and vegetables frozen as well as the pounds of commercial fruits, vegetables, pork, beef, and sea foods sold. In addition, information was assembled on the number of competing plants in the same and surrounding communities, the existence of individual frozen storage units, and the estimated percentage of farmers in the trade territory who were using locker service.

Questionnaires were sent to a tentative list of 3,300 locker plants. Approximately 2,000 of these questionnaires were returned of which 1,781 were coded; the remainder were eliminated either because the plants had been opened later than January 1, 1941, no plant was operating, or the information

provided was not adequate enough to be useful.

The reports on each question are analyzed in a number of different ways in order that the picture may be as complete as possible. Many of the analyses are designed to answer specific questions raised by operators, leaders, and students of the development.

The specific objectives of this study are as follows:

1. To supplement the information obtained from the 1940 study by gathering additional data on sales and miscellaneous services.
2. To analyze further the rental, capacity, affiliation, ownership, and rate structure in plants which reported the previous year as well as in plants which had not reported or additional plants opened since the 1940 survey.
3. To compare plants operating in the various States and regions, as well as those which had been opened during each of the past several years, on the basis of size, rentals, ownership, size of town, type of affiliated enterprise, rate structure, sales, and competition.

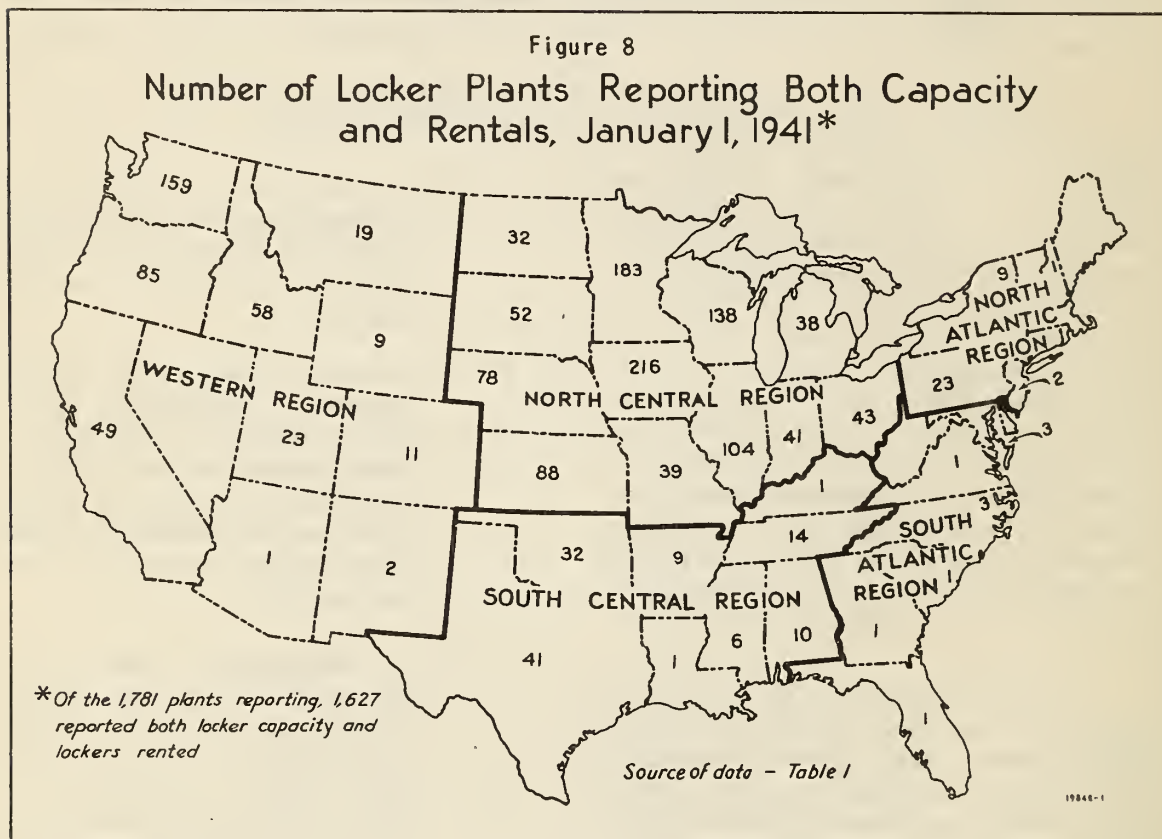
<sup>1</sup>1940 survey was published as Misc. Rpt. No. 24 "Frozen-Food Locker Plants in the United States," 26 pp. (mimeographed).

## AN ANALYSIS OF LOCKER PLANT CAPACITY AND RENTALS

*By States and year opened.*

Table 1 indicates the number of plants reporting both capacity and rentals, by States and the year opened, except that column 1 includes all plants opened prior to as well as during 1935.

Table 2 indicates the average capacity of the plants shown in table 1. It is of interest to note that the average capacity of 328 was approximately the same as the average of 330 in the 1,160 plants reporting during 1940. The data on average capacity of



Some operators misinterpreted the question on the year the plant was opened (table 1) and, hence, there may be a larger proportion in the group reported as opened during 1940 than there should be. Also, there may be further upward bias in the proportion of all plants reported as opened during 1940 resulting from the fact that the plants opened more recently are more likely to report. This would seem to be the case in Minnesota and Wisconsin particularly.

all plants by year opened indicate that except for those opened during 1937 there is a consistent decline in size (see table 5). The average size of plants by regions shows that the 35 plants reporting from the North Atlantic States were largest while the 1,052 plants in the North Central States were smallest. The size of the sample from many states renders insignificant the data on average capacity by states. However, within the North Central



TABLE 1. - NUMBER OF FROZEN FOOD LOCKER PLANTS REPORTING, BY STATES AND YEAR OF OPENING<sup>1</sup>

State	Plants opening in						Total all plants
	1935 and prior	1936	1937	1938	1939	1940	
	<i>Number</i>						
Ohio.....	1	1	6	10	11	14	43
Indiana.....	-	-	1	6	11	23	41
Illinois.....	-	1	12	24	38	29	104
Michigan.....	-	1	1	6	12	18	38
Wisconsin.....	2	3	11	29	45	48	138
Minnesota.....	2	4	28	56	49	44	183
Iowa.....	15	16	62	62	45	16	216
Missouri.....	3	2	4	4	8	18	39
North Dakota.....	1	-	2	8	6	15	32
South Dakota.....	2	4	9	6	10	21	52
Nebraska.....	13	10	9	17	22	7	78
Kansas.....	15	7	13	15	15	23	88
North Central States.....	54	49	158	243	272	276	1,052
Montana.....	-	-	2	5	9	3	19
Idaho.....	17	7	10	9	8	7	58
Wyoming.....	2	-	-	-	2	5	9
Colorado.....	3	1	1	3	2	1	11
New Mexico.....	-	-	1	-	1	-	2
Arizona.....	-	-	-	-	1	-	1
Utah.....	1	-	5	4	4	9	23
Washington.....	49	12	23	28	21	26	159
Oregon.....	15	11	4	14	22	19	85
California.....	17	2	6	5	8	11	49
Western States.....	104	33	52	68	78	81	416
Kentucky.....	-	-	-	-	-	1	1
Tennessee.....	-	-	1	-	7	6	14
Alabama.....	-	-	-	-	4	6	10
Mississippi.....	-	-	-	-	1	5	6
Arkansas.....	-	-	1	-	5	3	9
Louisiana.....	-	-	-	-	-	1	1
Oklahoma.....	3	4	4	8	6	7	32
Texas.....	-	-	-	3	7	31	41
South Central States.....	3	4	6	11	30	60	114
Vermont.....	-	-	-	-	1	-	1
New York.....	6	-	1	-	2	-	9
New Jersey.....	-	-	-	1	1	-	2
Pennsylvania.....	4	1	3	5	8	2	23
North Atlantic States.....	10	1	4	6	12	2	35
Maryland.....	-	-	-	-	2	1	3
Virginia.....	-	-	-	-	-	1	1
North Carolina.....	-	-	-	1	-	2	3
South Carolina.....	-	-	-	-	-	1	1
Georgia.....	-	-	-	-	-	1	1
Florida.....	-	-	-	-	-	1	1
South Atlantic States.....	-	-	-	1	2	7	10
United States.....	171	87	220	329	394	426	1,627

<sup>1</sup>Includes only plants reporting both capacity and number of lockers rented.

SOURCE OF DATA: Survey of the frozen food locker industry in the United States as of January 1, 1941, conducted by the Cooperative Research and Service Division, Farm Credit Administration, Washington, D. C.

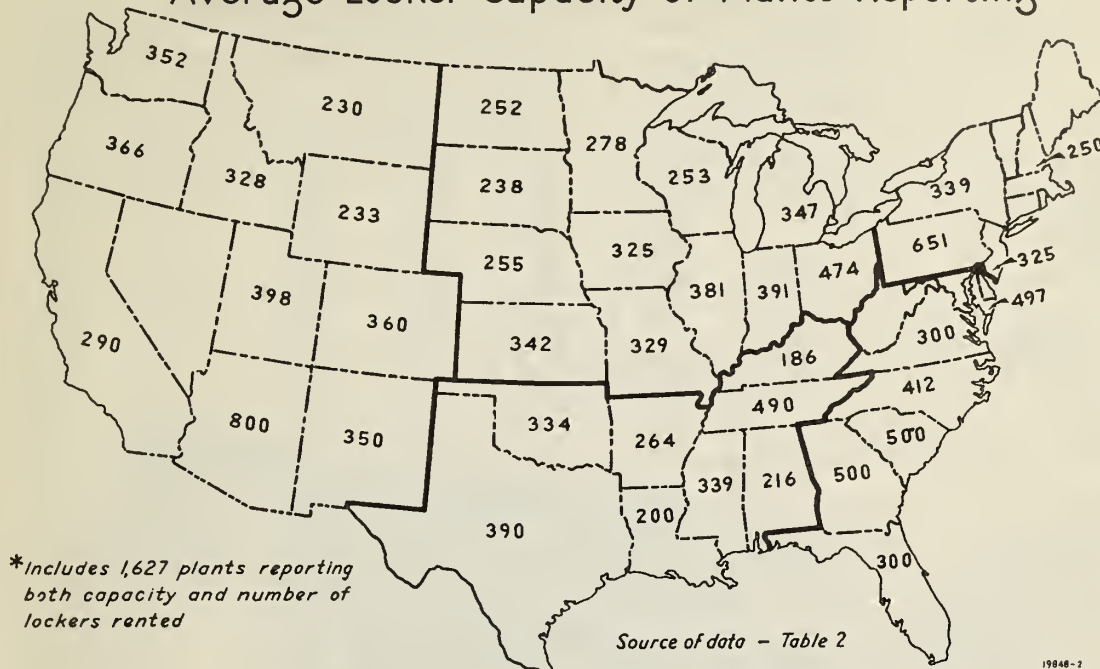
TABLE 2. - AVERAGE LOCKER CAPACITY OF 1,627 FROZEN FOOD LOCKER PLANTS, ANALYZED  
BY STATES AND YEAR OF OPENING

State	Average capacity of plants opened in						Average capacity of all plants
	1935 and prior	1936	1937	1938	1939	1940	
	<i>Number</i>						
Ohio.....	230	300	853	554	479	280	474
Indiana.....	-	-	1,275	620	415	282	391
Illinois.....	-	320	484	392	395	314	381
Michigan.....	-	80	300	459	366	315	347
Wisconsin.....	142	362	265	271	270	222	253
Minnesota.....	382	260	389	281	252	232	278
Iowa.....	434	445	364	303	250	250	325
Missouri.....	633	252	258	312	341	300	329
North Dakota.....	756	-	442	189	222	238	252
South Dakota.....	190	464	355	273	171	170	238
Nebraska.....	354	242	362	233	192	198	255
Kansas.....	382	474	385	332	297	287	342
North Central States.....	392	368	394	317	292	256	312
Montana.....	-	-	250	230	228	225	230
Idaho.....	516	259	271	245	206	270	328
Wyoming.....	160	-	-	-	139	300	233
Colorado.....	330	525	300	183	560	480	360
New Mexico.....	-	-	600	-	100	-	350
Arizona.....	-	-	-	-	800	-	800
Utah.....	1,000	-	630	278	326	289	398
Washington.....	384	402	358	431	284	232	352
Oregon.....	612	381	296	330	303	276	366
California.....	306	350	265	279	294	272	290
Western States.....	426	365	351	340	286	265	340
Kentucky.....	-	-	-	-	-	186	186
Tennessee.....	-	-	500	-	510	465	490
Alabama.....	-	-	-	-	206	223	216
Mississippi.....	-	-	-	-	490	309	339
Arkansas.....	-	-	200	-	328	178	264
Louisiana.....	-	-	-	-	-	200	200
Oklahoma.....	200	426	220	500	241	295	334
Texas.....	-	-	-	274	579	359	390
South Central States.....	200	426	264	438	401	330	356
Vermont.....	-	-	-	-	250	-	250
New York.....	367	-	300	-	275	-	339
New Jersey.....	-	-	-	150	500	-	325
Pennsylvania.....	1,216	1,090	725	419	506	350	651
North Atlantic States.....	707	1,090	619	374	446	350	541
Maryland.....	-	-	-	-	430	630	497
Virginia.....	-	-	-	-	-	300	300
North Carolina.....	-	-	-	240	-	498	412
South Carolina.....	-	-	-	-	-	500	500
Georgia.....	-	-	-	-	-	500	500
Florida.....	-	-	-	-	-	300	300
South Atlantic States.....	-	-	-	240	430	461	432
United States.....	428	378	384	327	304	272	328



Figure 9

# Average Locker Capacity of Plants Reporting\*



region, where all States reported 30 or more plants, Ohio with 43 reports had the largest plants and South Dakota the smallest. In general, the first plants opened in each area are largest. The reason for this will be brought out in subsequent analyses.

Table 3 includes the data on the percentage of capacity rented by the same plants shown in tables 1 and 2. Sixty-four percent of locker room capacity was rented on January 1, 1941, in all plants reporting, which is exactly the same as reported by the 1,160 plants in the 1940 survey. Further, as reported last year, the Western States have the highest percentage of their capacity rented with an average of 66.7 percent.

On a yearly basis, which eliminates the age factor and its relation to the rental situation in the plants

opened during 1939 and 1940, there is a less striking but nevertheless significant difference among States and regions.

A regional comparison by year opened indicates that the 104 plants opened in the Western States during 1935 and prior had 70.5 percent, or the highest percentage of their capacity rented of any region. This is particularly significant when it is noted that these plants have an average capacity of 426 lockers. Among all the plants opened during 1936 those in the North Central region, except for Pennsylvania which had 1 plant reported as opened in 1936, had the highest percentage rented with 71.9. Similarly, the plants in the North Central States led among those opened in the United States during 1937 and 1939, while the Western States had the highest percentage of capacity rented among all plants opened during 1938 and 1940.

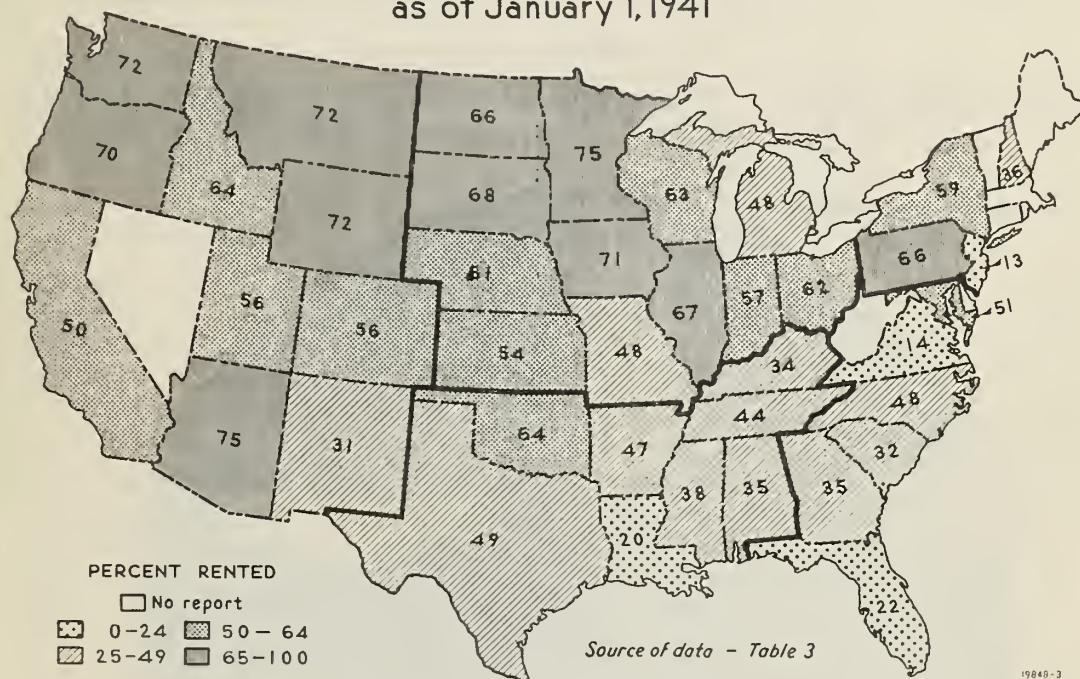
TABLE 3. - PERCENTAGE OF CAPACITY RENTED ON JANUARY 1, 1941, BY 1,627 FROZEN FOOD LOCKER PLANTS, ANALYZED BY STATES AND YEAR OF OPENING

State	Percentage of capacity rented in plants opened in						Total all plants
	1935 and prior	1936	1937	1938	1939	1940	
	Percent						
Ohio.....	100.0	100.0	55.2	65.5	64.1	55.7	61.6
Indiana.....	-	-	41.7	70.7	63.0	48.7	57.3
Illinois.....	-	100.0	67.6	80.4	68.2	51.7	67.4
Michigan.....	-	30.0	63.0	49.0	61.7	36.0	47.8
Wisconsin.....	82.4	86.6	75.8	72.4	68.7	44.3	63.3
Minnesota.....	96.5	88.6	79.2	81.4	73.2	60.4	75.1
Iowa.....	69.5	81.2	70.3	68.8	69.0	68.4	70.6
Missouri.....	50.7	45.0	50.1	53.6	60.0	39.1	47.8
North Dakota.....	18.5	-	55.8	78.1	71.8	55.8	66.1
South Dakota.....	63.2	74.6	71.0	77.7	78.7	52.8	68.0
Nebraska.....	72.8	63.2	52.0	54.0	63.8	51.5	61.0
Kansas.....	72.7	46.8	58.0	63.7	46.7	34.2	53.6
North Central States..	69.0	71.9	67.6	71.3	66.8	49.9	64.8
Montana.....	-	-	42.0	87.4	73.5	66.7	72.5
Idaho.....	58.2	61.4	71.8	82.2	63.3	59.3	63.8
Wyoming.....	60.3	-	-	-	96.0	70.7	72.5
Colorado.....	69.7	42.8	34.0	62.0	55.8	52.1	56.3
New Mexico.....	-	-	20.0	-	100.0	-	31.4
Arizona.....	-	-	-	-	75.0	-	75.0
Utah.....	33.0	-	61.2	75.0	56.2	51.4	56.3
Washington.....	79.5	69.9	74.7	72.9	64.1	57.1	72.5
Oregon.....	77.9	74.3	67.8	77.6	67.8	48.0	69.8
California.....	53.9	28.6	56.2	71.3	47.8	36.4	49.9
Western States.....	70.5	66.6	66.5	75.2	64.3	52.6	66.7
Kentucky.....	-	-	-	-	-	34.4	34.4
Tennessee.....	-	-	46.0	-	49.3	38.0	44.4
Alabama.....	-	-	-	-	50.9	25.8	35.4
Mississippi.....	-	-	-	-	37.8	37.4	37.5
Arkansas.....	-	-	25.0	-	47.5	55.0	47.3
Louisiana.....	-	-	-	-	-	19.5	19.5
Oklahoma.....	57.0	68.3	63.0	67.0	67.8	54.9	64.1
Texas.....	-	-	-	69.7	42.2	49.5	48.7
South Central States..	57.0	68.3	52.8	67.4	48.5	45.6	50.4
Vermont.....	-	-	-	-	36.0	-	36.0
New York.....	61.5	-	100.0	-	24.7	-	58.7
New Jersey.....	-	-	-	24.0	10.0	-	13.2
Pennsylvania.....	81.1	96.8	66.5	57.0	52.6	25.7	66.5
North Atlantic States.	75.0	96.8	70.6	54.8	45.0	25.7	63.0
Maryland.....	-	-	-	-	59.3	39.7	51.0
Virginia.....	-	-	-	-	-	14.0	14.0
North Carolina.....	-	-	-	100.0	-	35.0	47.6
South Carolina.....	-	-	-	-	-	32.0	32.0
Georgia.....	-	-	-	-	-	35.0	35.0
Florida.....	-	-	-	-	-	21.7	21.7
South Atlantic States.	-	-	-	100.0	59.3	32.2	41.4
United States .....	70.4	70.6	67.1	71.7	63.5	49.0	64.0

On a State basis, including plants opened during all years, Minnesota leads with 75.1 percent of its plant capacity rented. Arizona, which had only 1 plant reporting, ranked next with Washington, Montana, Wyoming, Oregon, Iowa, South Dakota, Illinois, and Pennsylvania, ranking in that order, having 66 percent or more of their capacity rented.

one plant each with 100 percent rented, with Pennsylvania, Minnesota, Wisconsin, Iowa, South Dakota, and Oregon, ranking in that order, having 74 percent or more rented. Among the 1937 plants, Minnesota led with 28 plants having 79.2 percent of their average capacity for 389 lockers rented, with plants in Wisconsin, Washington, Idaho, and South Dakota opened during that year having more

Figure 10  
Percentage of Locker Capacity Rented in Plants Reporting  
as of January 1, 1941



The data for States by year opened is of little value for many States because of the small size of the sample. However, among the plants opened during 1935 and prior, the 1 plant reporting from Ohio had 100 percent rented while those opened in Minnesota followed with 96.5 percent. Wisconsin, Pennsylvania, Washington, Colorado, and Oregon followed in that order. In the 1936 plants, Ohio and Illinois reported

than 70 percent rented. Among the 1938 plants the 5 plants reporting from Montana led with 87.4 percent of their capacity rented, followed by Idaho, Minnesota, Illinois, North and South Dakota, Oregon, and Utah plants with more than 75 percent rented. Among the 1939 plants, the one plant reporting from New Mexico led with 100 percent of its capacity reported as rented on January 1, 1941, with Wyoming, South



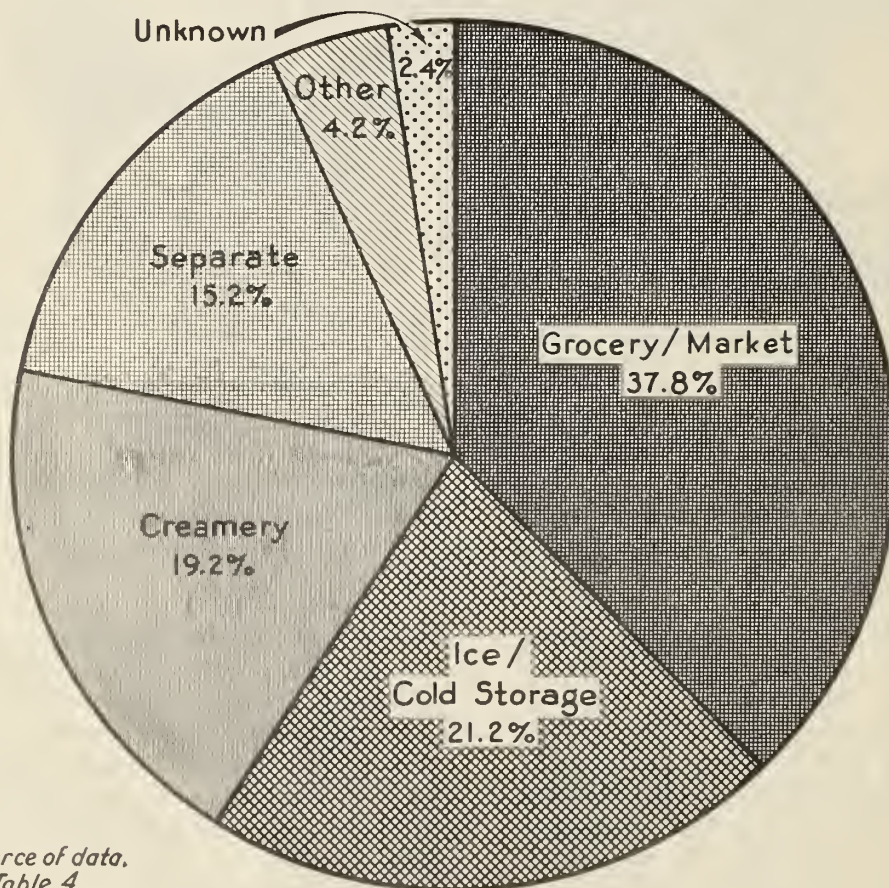
Dakota, Arizona, Montana, Minnesota, and North Dakota having better than 70 percent rented.

To the extent that plants were built to fill the potential demand for locker service in each community, these percentage rental figures indicate the degree to which people are using this method of preserving their foods. A second possible interpretation of these data might be that it indicates how well the type of service rendered and the size of plants fit the needs of each community.

#### *By Affiliation, Year Opened, and Region*

In tables 4, 5, and 6 the same 1,627 reports used in tables 1, 2, and 3 are analyzed by affiliation, year opened, and region. Table 4 indicates that the number of plants opened by groceries and meat markets in the United States as a whole has been growing at an increasingly rapid rate, while the rate of expansion among those connected with ice and cold storage plants has been declining. On the other hand, the number opened by creameries, ice cream, poultry, and plants affiliated with

FIGURE II  
AFFILIATIONS OF 1,627 FROZEN FOOD LOCKER PLANTS  
REPORTING, JANUARY 1, 1941



Source of data,  
Table 4

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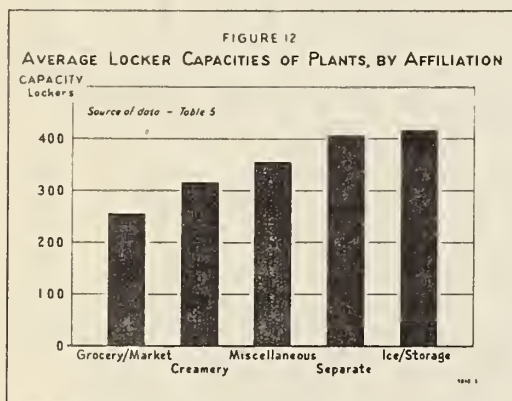
TABLE 4. - NUMBER OF FROZEN FOOD LOCKER PLANTS REPORTING WHICH WERE AFFILIATED WITH OTHER ENTERPRISES, ANALYZED BY REGIONS AND YEAR OF OPENING

Region and type of affiliation	Number of plants opened in						Total
	1935 and prior	1936	1937	1938	1939	1940	
	Number						
North Central States:							
Grocery/Market.....	5	7	36	90	106	151	395
Ice/Storage.....	33	18	33	38	38	16	176
Creamery.....	12	13	51	62	40	46	224
Other.....	3	3	5	3	13	11	38
Separate.....	1	7	30	47	65	44	194
Unknown.....	-	1	3	3	10	8	25
Total.....	54	49	158	243	272	276	1,052
Western States:							
Grocery/Market.....	26	11	25	37	44	49	192
Ice/Storage.....	39	8	8	15	14	11	95
Creamery.....	29	6	11	9	11	7	73
Other.....	4	2	2	-	5	4	17
Separate.....	6	2	5	5	4	5	27
Unknown.....	-	4	1	2	-	5	12
Total.....	104	33	52	68	78	81	416
South Central States:							
Grocery/Market.....	1	-	-	2	7	16	26
Ice/Storage.....	-	3	4	7	11	20	45
Creamery.....	2	-	2	1	3	3	11
Other.....	-	-	-	-	3	9	12
Separate.....	-	1	-	1	5	11	18
Unknown.....	-	-	-	-	1	1	2
Total.....	3	4	6	11	30	60	114
North Atlantic States:							
Grocery/Market.....	-	-	-	1	1	-	2
Ice/Storage.....	9	1	3	5	7	-	25
Creamery.....	1	-	1	-	1	1	4
Other.....	-	-	-	-	-	-	-
Separate.....	-	-	-	-	3	1	4
Unknown.....	-	-	-	-	-	-	-
Total.....	10	1	4	6	12	2	35
South Atlantic States:							
Grocery/Market.....	-	-	-	-	-	1	1
Ice/Storage.....	-	-	-	1	1	2	4
Creamery.....	-	-	-	-	-	-	-
Other.....	-	-	-	-	-	1	1
Separate.....	-	-	-	-	1	3	4
Unknown.....	-	-	-	-	-	-	-
Total.....	-	-	-	1	2	7	10
United States:							
Grocery/Market.....	32	18	61	130	158	217	616
Ice/Storage.....	81	30	48	66	71	49	345
Creamery.....	44	19	65	72	55	57	312
Other.....	7	5	7	3	21	25	68
Separate.....	7	10	35	53	78	64	247
Unknown.....	-	5	4	5	11	14	39
Total.....	171	87	220	329	394	426	1,627



other enterprises in this group, as well as separate units show no definite trends in the rate of expansion.<sup>2</sup>

The increase in the number as well as the rate of expansion of plants affiliated with meat markets and grocery stores was most rapid in the North Central region, the area in which the development is oldest. On the other hand, only a relatively small percentage of the plants opened during 1940 in the South Central and the North and South Atlantic regions was operated by meat markets. Thus, it would appear that in general the meat markets and grocery stores add locker departments after other locker plants are operating in the area.



In table 5 the data on the average capacity of these plants reveal three significant facts: (1) The marked difference in the average capacity of plants affiliated with the various enterprises in the United States as a whole, (2) the difference in capacity by affiliation as between regions, and (3) the trends in the size of plants opened by various enterprises and regions.

In the United States as a whole, those units affiliated with meat markets and grocery stores are less than two-thirds as large as the units operated

as separate enterprises. Locker plants opened by ice and cold storage plants, although the largest on the average, have shown a marked decline, dropping from an average of 496 for plants opened during 1935 and prior to 276 for those opened during 1940. This change in the average size is largely because of the number and relatively small size of the units opened by ice plants in the South Central States. This decline, together with the growing number and importance of small units affiliated with meat markets and grocery stores, accounts for a large proportion of the decline in the size of all plants. Furthermore, it is possible that many of the older plants may have increased their locker capacity since they were originally built. At any rate, the size of plants opened by any one group in any one region during the past 6 years, has not changed materially during that period.

It is interesting to note that in the North Central region the average size of plants opened by meat markets, creameries, and as separate enterprises during 1937 was larger than that of plants opened in either 1936 or 1938. This may have been the result of increased business activity. If this is true, then it may be expected that the average size of plants opened during 1941 and 1942 may be comparatively large.

Table 6 shows the average percentage of locker capacity rented on January 1, 1941, by the plants opened during each of the past 6 years by various types of enterprises. These data measure the relative success of of each group in renting lockers and, to the extent that other factors are equal, it is an excellent basis for comparing the financial success of the enterprise. The latter is particularly true in the

<sup>2</sup>In the survey report for 1940, the ice cream plants were grouped with the ice and cold storage units.



TABLE 5. - AVERAGE CAPACITY OF 1,627 FROZEN FOOD LOCKER PLANTS REPORTING ON JANUARY 1, 1941, ANALYZED BY AFFILIATION AND YEAR OF OPENING

Region and type of affiliation	Average capacity of plants opened in						Total
	1935 and prior	1936	1937	1938	1939	1940	
	Number						
<i>North Central States:</i>							
Grocery/Market.....	348	276	340	242	222	228	242
Ice/Storage.....	429	433	388	457	351	306	400
Creamery.....	282	316	400	279	257	243	298
Other.....	472	203	277	437	386	236	324
Separate.....	450	440	476	398	373	341	391
Unknown.....	-	526	365	212	293	323	311
All types.....	392	368	394	317	292	256	312
<i>Western States:</i>							
Grocery/Market.....	290	258	262	304	243	259	269
Ice/Storage.....	512	588	615	424	356	231	458
Creamery.....	448	391	334	157	229	160	343
Other.....	540	335	250	-	328	267	355
Separate.....	270	325	497	483	605	495	447
Unknown.....	-	214	132	374	-	304	271
All types.....	426	365	351	340	286	265	340
<i>South Central States:</i>							
Grocery/Market.....	80	-	-	368	432	305	336
Ice/Storage.....	-	448	231	325	276	263	285
Creamery.....	260	-	328	510	263	377	328
Other.....	-	-	-	-	460	456	457
Separate.....	-	360	-	1,300	678	357	499
Unknown.....	-	-	-	-	410	480	445
All types.....	200	426	264	438	401	330	356
<i>North Atlantic States:</i>							
Grocery/Market.....	-	-	-	490	400	-	445
Ice/Storage.....	674	1,090	658	351	478	-	569
Creamery.....	1,000	-	500	-	250	600	588
Other.....	-	-	-	-	-	-	-
Separate.....	-	-	-	-	452	100	364
Unknown.....	-	-	-	-	-	-	-
All types.....	707	1,090	619	374	446	350	541
<i>South Atlantic States:</i>							
Grocery/Market.....	-	-	-	-	-	495	495
Ice/Storage.....	-	-	-	240	400	400	360
Creamery.....	-	-	-	-	-	-	-
Other.....	-	-	-	-	-	300	300
Separate.....	-	-	-	-	460	543	522
Unknown.....	-	-	-	-	-	-	-
All types.....	-	-	-	240	430	461	432
<i>United States:</i>							
Grocery/Market.....	292	265	308	263	239	242	255
Ice/Storage.....	496	497	430	424	354	276	413
Creamery.....	407	340	388	280	252	246	313
Other.....	511	256	269	437	384	323	355
Separate.....	296	409	479	423	409	361	406
Unknown.....	-	277	307	277	304	327	306
All types.....	428	378	384	327	304	272	328

locker room operation itself where fixed operating costs make up a large proportion of the total. In making comparisons, of course, differences in size must be considered, for the larger the unit the lower the costs per locker are likely to be. In general, plants with a capacity of 300 to 500 lockers which charge the usual rates (see table 12) for service and rentals will show profit only when more than 62 percent of their capacity is rented. Larger plants may show profits with a smaller percentage rented, while the smaller units will need to have a greater percentage rented.

The summary of table 6 indicates that on the average those plants affiliated with creameries, ice cream, and poultry plants are most successful in renting their lockers. They have, on an average, 69.9 percent of their average capacity of 313 lockers rented. Plants operated as separate enterprises rank next in line with 64.7 percent of 406 lockers rented, while groceries and meat markets have 63.1 percent of 255 lockers rented. This same ranking holds true in both the North Central and Western regions. However, in the South Central States separate plants seem to have been most successful, with plants affiliated with meat markets and ice plants next.

The data by year opened, which eliminates the factor of age and its effect on rentals, indicate that among all the plants opened in the United States during 1938, 1939, and 1940, creameries and their related groups led in the percentage of capacity rented, while among the plants opened during 1935 and prior as well as during 1937 the plants operated as separate enterprises had the highest percentage of their capacity rented on January 1, 1941.

In the North Central region the same ranking holds true. Thus, among the plants opened during 1936, 1938, and 1940, those operated by creameries and related types of enterprises had the highest percentage of their capacity rented, while of all plants opened during 1935 and prior, 1937, and 1939 in this region, those operated as separate enterprises had the highest percentage of capacity rented. The latter is particularly significant in that separate plants are next to the largest on the average and the largest of all plants opened during 1939. These same groups led in the Western States except for plants opened during 1936, in which group those opened by groceries and meat markets had been most successful.

The importance attached to percentage rentals as a means of measuring financial success, as mentioned earlier, must be weighted with such factors as size, processing and rental rates and, in addition, the number and volume of processing services rendered as well as the all-important factor of efficiency in rendering the service.

In general, these data on size and rentals tend to disprove the contention that the change in the size of all units is due to the success or failure of large or small plants. Rather it would seem to be due to the change in the number and importance of plants opened by various types of enterprises and the rate of growth by regions or general areas.

#### *By Ownership and Year Opened*

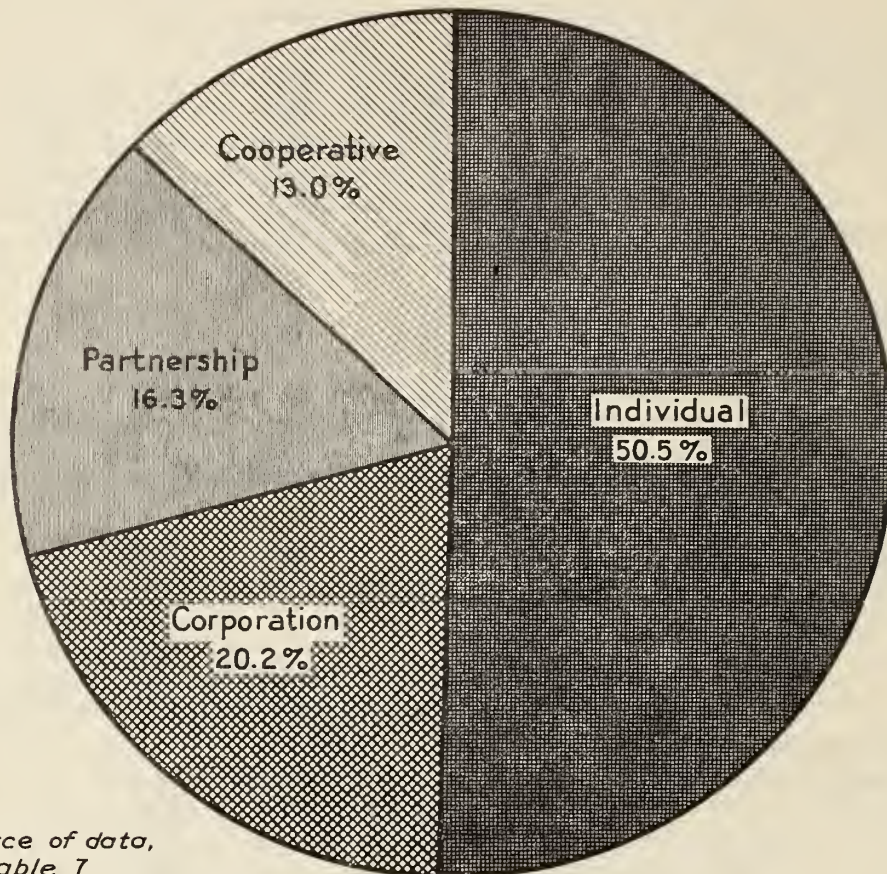
The analysis of plant capacity and rentals by ownership types in table 7 indicates that the number of plants opened by individuals has become increasingly important during the past 6 years. Thus, although individuals owned only two-fifths of the plants operating at the close of 1935, they were operating half of all plants reporting at the close of 1940.

TABLE 6. - PERCENTAGE OF CAPACITY RENTED ON JANUARY 1, 1941, IN 1,627 FROZEN FOOD LOCKER PLANTS, ANALYZED BY AFFILIATION, REGION, AND YEAR OF OPENING

Region and type of affiliation	Percentage of capacity rented in plants opened in						Total
	1935 and prior	1936	1937	1938	1939	1940	
	Percent						
North Central States:							
Grocery/Market.....	69.0	70.3	64.0	72.1	68.2	51.8	62.7
Ice/Storage.....	69.2	60.7	60.4	64.8	58.6	40.4	61.6
Creamery.....	75.7	84.3	70.5	76.4	70.6	61.9	71.7
Other.....	43.9	78.7	83.3	58.8	58.4	50.3	58.9
Separate.....	88.9	80.6	72.5	72.9	70.8	42.6	66.6
Unknown.....	-	90.3	50.2	66.4	60.4	33.8	52.6
All types.....	69.0	71.9	67.6	71.3	66.8	49.9	64.8
Western States:							
Grocery/Market.....	74.1	84.4	67.7	73.4	68.8	49.4	66.5
Ice/Storage.....	62.6	60.6	63.7	74.9	52.5	60.3	63.0
Creamery.....	74.5	68.6	63.7	81.6	68.3	67.6	72.1
Other.....	93.5	50.7	86.0	-	69.5	62.2	76.1
Separate.....	89.4	41.2	69.8	88.1	61.2	42.9	67.3
Unknown.....	-	66.1	50.8	42.7	-	65.0	59.6
All types.....	70.5	66.6	66.5	75.2	64.3	52.6	66.7
South Central States:							
Grocery/Market.....	81.2	-	-	64.7	45.6	50.1	50.1
Ice/Storage.....	-	62.4	52.4	57.1	57.8	36.8	49.2
Creamery.....	53.3	-	53.4	54.1	23.6	42.9	43.7
Other.....	-	-	-	-	76.1	45.3	53.0
Separate.....	-	90.3	-	92.3	33.2	50.8	51.8
Unknown.....	-	-	-	-	82.9	61.4	71.3
All types.....	57.0	68.3	52.8	67.4	48.5	45.6	50.4
North Atlantic States:							
Grocery/Market.....	-	-	-	55.1	20.0	-	39.3
Ice/Storage.....	84.1	96.8	68.2	54.8	44.8	-	70.0
Creamery.....	20.0	-	80.0	-	36.0	23.3	35.3
Other.....	-	-	-	-	-	-	-
Separate.....	-	-	-	-	54.5	40.0	53.5
Unknown.....	-	-	-	-	-	-	-
All types.....	75.0	96.8	70.6	54.8	45.0	25.7	63.0
South Atlantic States:							
Grocery/Market.....	-	-	-	-	-	50.5	50.5
Ice/Storage.....	-	-	-	100.0	50.0	17.5	40.3
Creamery.....	-	-	-	-	-	-	-
Other.....	-	-	-	-	-	21.7	21.7
Separate.....	-	-	-	-	67.4	35.9	42.8
Unknown.....	-	-	-	-	-	-	-
All types.....	-	-	-	100.0	59.3	32.2	41.4
United States:							
Grocery/Market.....	73.2	78.7	65.3	72.1	66.1	51.0	63.1
Ice/Storage.....	68.2	63.5	61.6	66.1	55.3	41.4	61.5
Creamery.....	71.1	78.6	69.2	76.4	66.9	59.2	69.9
Other.....	73.9	64.1	84.0	58.8	63.7	48.2	61.4
Separate.....	89.3	75.2	72.1	75.7	65.3	43.5	64.7
Unknown.....	-	75.3	50.2	53.6	63.1	47.1	55.9
All types.....	70.4	70.6	67.1	71.7	63.5	49.0	64.0



Figure 13  
OWNERSHIP OF 1,627 FROZEN FOOD LOCKER PLANTS  
REPORTING, JANUARY 1, 1941



*Source of data,  
Table 7*

19848-6

Cooperatives, which were operating about 10 percent of the plants at the end of 1936, had increased relatively to 13 percent of all plants reporting on January 1, 1941. Partnerships also gained in importance, while corporations declined from 42 percent in 1935 to 20 percent of all plants reporting on January 1, 1941. This change in relative importance was due, in a large measure, to a shift in the type of business with which plants were affiliated (see table 4). Thus, the increase in the number of

small and individually owned meat market and grocery store units opened accounts, no doubt, for the increase in individual ownership.

The data on the size of plants by ownership type and year opened demonstrate that corporately owned plants are 62 percent larger than those individually owned while cooperative plants, which are next largest, are 26 percent larger. Although there has been some decline in the size of plants opened by all types of ownership during the past

5 years, it would appear from the following analysis of percentage rentals that this might be due to factors other than the success or failure of plants of a particular size.

Most significant are the data on rentals. These data show that even though the units operated by cooperatives are 26 percent larger than those individually owned, they have 8.5 percent more of their capacity rented. Similarly, the partnerships, with 19 percent larger plants, have 1.1 percent more of their locker capacity in use. Therefore, lack of success in the larger plants does not explain the rapid increase in the proportion of smaller locker plant units opened during the past 3 years.

#### *By Ownership and Regions*

In table 8 the data on capacity and rentals by ownership types are analyzed on a regional basis. The data on number and percentage of plants opened by various types of ownership indicate:

1. Individual ownership is more important in The Western and North Central regions where the industry is oldest.
2. Cooperatives are twice as important in the North Central and South Central regions as in the Western and North Atlantic regions.

3. Corporations are most important in the North and South Atlantic regions where the development is in the initial stages.

The latter point indicates again that the larger organizations pioneer in new areas while the individual and smaller units increase in importance as the public gets acquainted with locker use.

The data on average size of plants by regions and ownership types indicate that there is considerable variation in the size of plants opened by ownership groups as between regions. Thus, individually owned plants in the North and South Atlantic States are 50 percent larger than those so owned in the North Central region. Cooperative plants opened in the South Central States are the smallest of this type in any region, and they are largest in the North Atlantic area.

As measured by percentage rentals in various regions, the cooperatives have been more successful than other ownership types in the North Central and Western States. Cooperatives had 8 percent more than average locker capacity rented in the North Central region and 14.8 percent more than average rented in the Western region. Partnerships were most successful in the South Central States, corporations in the North Atlantic region, and individuals in the South Atlantic region.

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TABLE 7. - LOCKER CAPACITY AND RENTALS IN PLANTS REPORTING, ANALYZED BY OWNERSHIP AND YEAR OF OPENING

Year opened	Number of plants opened by				Total
	Individuals	Cooperatives	Partnerships	Corporations	
	<i>Number</i>				
1935 and prior	65	17	17	72	171
1936	40	9	13	25	87
1937	101	43	32	44	220
1938	170	41	64	54	329
1939	207	47	63	77	394
1940	239	54	76	57	426
All years....	822	211	265	329	1,627
	Percentage of plants opened by				All types
	Individuals	Cooperatives	Partnerships	Corporations	
	<i>Percent</i>				
1935 and prior	38.0	10.0	9.9	42.1	100.0
1936	46.0	10.3	15.0	28.7	100.0
1937	45.9	19.6	14.5	20.0	100.0
1938	51.7	12.5	19.4	16.4	100.0
1939	52.5	11.9	16.0	19.6	100.0
1940	56.1	12.7	17.8	13.4	100.0
All years....	50.5	13.0	16.3	20.2	100.0
	Average locker capacity of plants opened by				All types
	Individuals	Cooperatives	Partnerships	Corporations	
	<i>Lockers</i>				
1935 and prior	362	460	274	515	428
1936	272	352	419	535	378
1937	326	396	431	473	384
1938	267	343	365	457	327
1939	255	332	305	419	304
1940	255	293	268	325	272
All years....	276	348	328	446	328
	Percentage of locker capacity rented on January 1, 1941, in plants opened by				All types
	Individuals	Cooperatives	Partnerships	Corporations	
	<i>Percent</i>				
1935 and prior	71.7	82.6	75.6	66.3	70.4
1936	70.8	80.2	73.7	66.9	70.6
1937	66.2	70.8	65.4	66.8	67.1
1938	72.3	80.6	69.4	67.8	71.7
1939	63.6	73.0	66.6	56.8	63.5
1940	49.5	56.0	50.1	40.3	49.0
All years....	63.1	71.6	64.2	61.3	64.0



TABLE 8. - LOCKER CAPACITY AND RENTALS IN PLANTS REPORTING, ANALYZED BY OWNERSHIP AND REGIONS

Region	Number of plants owned by				Total
	Individuals	Cooperatives	Partnerships	Corporations	
	<i>Number</i>				
North Central States.....	539	160	183	170	1,052
Western States.....	237	29	57	93	416
South Central States.....	34	18	22	40	114
North Atlantic States.....	8	3	3	21	35
South Atlantic States.....	4	1	-	5	10
United States.....	822	211	265	329	1,627
	Percentage of plants owned by				Total, all types
	Individuals	Cooperatives	Partnerships	Corporations	
	<i>Percent</i>				
North Central States.....	51.2	15.2	17.4	16.2	100.0
Western States.....	57.0	7.0	13.7	22.3	100.0
South Central States.....	29.8	15.8	19.3	35.1	100.0
North Atlantic States.....	22.8	8.6	8.6	60.0	100.0
South Atlantic States.....	40.0	10.0	-	50.0	100.0
United States.....	50.5	13.0	16.3	20.2	100.0
	Average locker capacity of plants owned by				Average, all types
	Individuals	Cooperatives	Partnerships	Corporations	
	<i>Lockers</i>				
North Central States.....	262	336	319	441	312
Western States.....	284	420	359	445	340
South Central States.....	369	322	298	391	356
North Atlantic States.....	495	417	453	588	541
South Atlantic States.....	375	500	-	465	432
United States.....	276	348	328	446	328
	Percentage of lockers rented in plants owned by				All types
	Individuals	Cooperatives	Partnerships	Corporations	
	<i>Percent</i>				
North Central States.....	63.4	72.8	63.5	62.7	64.8
Western States.....	66.5	81.5	68.3	62.1	66.7
South Central States.....	46.0	53.2	59.8	49.1	50.4
North Atlantic States.....	55.0	24.8	55.6	70.2	63.0
South Atlantic States.....	47.5	35.0	-	38.8	41.4
United States.....	63.1	71.6	64.2	61.3	64.0

## FARM AND NONFARM PATRONAGE

### *Percentage of Locker Patrons That Are Farmers.*

In table 9 the reports on the percentage of all patrons who were farmers on January 1, 1941, are analyzed by regions, year plants opened, and type of affiliated enterprise. In general, these figures indicate that approximately three-fourths of all patrons are farmers. This, coupled with the fact that 75 percent of the plants are in towns of less than 5,000 population (see table 12), demonstrates that the locker industry to date is based largely on service to farmers, retired farmers, or those closely associated with farms and farming.

Table 9 demonstrates the difference in farm and nonfarm patronage by regions and affiliations. It is evident farmers are most important in the North Central region and least important in the South Atlantic region. This difference may be due to a number of different factors, most important of which are: (1) The size of town in which plants are located or the demand of town families for this service; (2) the type of farming or the type of home-grown products available for storage; and (3) the type of operation or emphasis on processing of locally grown foods as against the sale to locker patrons of food grown elsewhere.

It is significant that locker plants in connection with ice and cold storage plants have a much lower percentage of farmers than those affiliated with other enterprises.

The data in table 9 also indicate that the older plants in the North Central and Western regions have a slightly higher percentage of farmers using lockers than the plants opened more recently. This may indicate a number of things: First, farmers may

be somewhat slower to adopt the locker system than town families; and, second, the older plants may emphasize the type of service desired by farmers more than the newer plants. The latter, in turn, may be because of the difference in the type of enterprise with which locker plants are affiliated. Of interest also is the fact that this difference in farm patronage is definitely contradictory to what might be expected from the decline in the average size of the towns in which locker plants are located (see table 13).

The data on the South Central region in table 9 do not indicate a clear-cut difference in farm patronage as between the newer and older plants. However, in the North Atlantic States, the farmers seem to be more important in the newer plants. Table 4 indicates that there has been an increase in the number of plants devoted to locker use only in this region whereas the older plants were all operated in connection with ice plants. This accounts in part for the higher percentage of farmer patronage in the newer plants in the North Atlantic region.

The analysis of farm patronage by affiliation and year opened was designed to answer the question as to whether those plants affiliated with a particular type of enterprise would be likely to increase or decrease their farmer patronage more than the others. These data, however, do not indicate that such is the case. On the other hand, they do show that the relatively high percentage of farm patrons in the plants opened during 1937 obviously results from the high percentage of farmers using the relatively large number of plants opened in connection with creameries and as separate enterprises during that year.

TABLE 9. - THE PERCENTAGE OF LOCKER PATRONS WHO ARE FARMERS, ANALYZED BY REGION AND YEAR OF PLANT OPENING AND BY AFFILIATION AND YEAR OF PLANT OPENING

Affiliated enterprise	Farm patrons as percentage of all patrons					United States	
	North Central States	Western States	South Central States	North Atlantic States	South Atlantic States		
	Percent						
Grocery/Market....	79.4	61.3	52.9	74.1	30.0	72.4	
Ice/Storage.....	69.2	64.2	51.1	64.3	56.1	65.7	
Creamery.....	78.1	69.8	49.1	91.2	-	75.6	
Other.....	80.5	55.5	51.9	-	70.0	70.4	
Separate.....	74.2	60.8	50.3	49.7	44.5	70.8	
Unreported.....	78.5	68.9	42.0	-	-	72.5	
All types....	75.9	63.8	51.0	65.6	47.0	71.0	
	By region and year of plant opening						
Year of plant opening:	Percent						
1935 and prior	75.4	68.7	56.7	64.8	-	70.2	
1936	74.6	66.4	72.9	65.0	-	71.3	
1937	77.5	61.0	56.3	72.3	-	74.2	
1938	76.6	63.3	40.4	52.6	88.9	72.4	
1939	75.1	57.5	42.1	68.4	22.8	68.9	
1940	74.7	62.2	56.3	78.6	46.8	69.2	
	By affiliation and year of plant opening						
Affiliated enterprise:	1935 <sup>1</sup>	1936	1937	1938	1939	1940	Total all plants
	Percent						
Grocery/Market....	71.8	69.1	72.8	74.1	72.4	71.0	72.4
Ice/Storage.....	67.9	73.5	64.1	62.8	62.7	64.1	65.7
Creamery.....	75.0	64.6	79.0	77.0	76.0	72.0	75.6
Other.....	62.5	91.8	77.9	81.2	68.9	63.8	70.4
Separate.....	68.6	68.2	78.2	75.6	65.3	66.7	70.8
Unreported.....	-	83.6	65.3	77.8	70.5	69.4	72.5
All types....	70.2	71.3	74.2	72.4	68.9	69.2	71.0

<sup>1</sup> Includes prior years.

#### Estimated Percentage of Farmers Using Lockers in Trade Territories of Plants Reporting.

On the questionnaire used in the survey, the locker plant operators were asked to estimate the percentage of all farmers within the trade territory of their plants who use lockers. The average of these estimates is presented on a State basis in figure 14. Such estimates are subject to error resulting from the opinion of operators as to what constitutes their trade territory as well as the difficulty in measuring

the percentage of farm use. Assuming all farming areas are similar, these data are significant in that the figures indicate the probable potential locker use by farmers as a whole. Of course, in the States in which the development is new the percentage figure is probably lower than it will be next year and the year after. On the other hand, most States have a varied type of farming and it is quite likely that the first plants are located in the communities where lockers would be in greatest demand.



Figure 14



It is of interest to note that the percentage of all farmers using lockers

26

**Percentage of All Farmers in 10 Leading States Using Lockers.**

Assuming that lockers would appeal to all communities in the same State to the same extent, a comparison of the estimated percentage using lockers within the trade territory of present plants and a computed percentage of all farmers in the State who were using lockers would seem of value. The difference between these two figures may be used as a basis for estimating the probable future expansion of locker use among farmers.

These data reveal that there was considerable variation in the percentage of all farmers using lockers. Thus, in Washington 65 percent of the farmers were using lockers on January 1, 1941, while only 10 percent of all farmers in Kansas were using the service. Although the development in Washington was somewhat earlier than in Kansas, the difference in maturity does not explain this marked variation in usage. Hence, as mentioned in earlier sections, other conditions such as the type of service rendered and the more extensive and specialized

**TABLE 10. - PERCENTAGE OF ALL FARMERS IN 10 LEADING STATES USING LOCKERS, JANUARY 1, 1941**

State	Total number of patrons <sup>1</sup>	Percentage of all patrons who were farmers <sup>2</sup>	Total number of farm patrons <sup>3</sup>	Total number of farmers <sup>4</sup>	Percentage of all farmers using lockers <sup>5</sup>
	Number	Percent	Number	Number	Percent
Iowa.....	113,949	.80	91,159	213,318	42.7
Washington.....	84,440	.63	53,197	81,686	65.1
Wisconsin.....	49,211	.79	38,877	186,735	20.8
Minnesota.....	56,558	.78	44,115	197,351	22.4
Illinois.....	55,046	.78	42,936	213,439	20.1
Nebraska.....	26,319	.80	21,055	121,062	17.4
Oregon.....	39,383	.67	26,387	61,829	42.7
Kansas.....	23,098	.68	15,707	156,327	10.0
Idaho.....	20,757	.65	13,492	43,663	30.9
South Dakota.....	15,537	.77	11,963	72,454	16.5
Total, 10 States.	467,088	.75	350,316	1,347,864	26.0

<sup>1</sup>Estimate based on average number of patrons in plants reporting multiplied by estimated total number of plants.

<sup>2</sup>Based on reports of farm and nonfarm patronage.

<sup>3</sup>Percent multiplied by estimated total patronage.

<sup>4</sup>Based on 1940 census - assuming that number of farms represents total number of farmers.

<sup>5</sup>Percentage that estimated total farm patrons are of total number of farmers.

In computing the percentage of all farmers using lockers in the 10 leading States as shown in table 10, it was assumed that the patronage in the plants reporting was representative of all plants operating in the State. Thus, by multiplying the average patronage in the plants reporting by the estimated total number of plants operating, the total of farm locker patronage in the State is obtained, although this method may involve some error. The sample from the 10 States, which have the largest number of plants, would seem to be large enough to make the error insignificant.

type of farming are probably important factors affecting locker usage.

A comparison of the percentages for these particular States as shown in table 10 and figure 18, indicates that in the States of Oregon, Iowa, and Washington the average of operators' estimates was fairly close to the computed percentage of all farmers using lockers. This would indicate that most communities were being served. On the other hand, in a number of these States the operators' estimates of percentage of farmer use in their trade territories

was much higher than the percentage of all farmers in the State using lockers. The latter indicates that many communities are not as yet served. Further, these data in table 10 indicate that although a sizable group of farmers in these States are using lockers there is still room for a marked growth in the usage of existing plants. The large percentage of nonusers in some States offers a challenge to existing operators. The problem for them is one of finding out how the service may be changed or improved so as to make locker use feasible or attractive to those farmers who are not patrons.

*Average Number of Town  
Patrons Per Plant.*

In table 11 the actual number of town patrons using lockers is analyzed by regions and size of town. These data should provide a partial answer to the question often raised by the prospective operator; namely, "How many town patrons can I assume will use lockers in my town?".

Because of the small size of the sample and the recentness of the development, these data are not dependable for the North Atlantic, South Atlantic,

and South Central States. On the other hand, the figures from the Western and North Central States should be representative of town patronage for plants 3 years old.

It is significant that the plants in the Western States report a larger average number of town patrons per plant in all town sizes than the plants reporting from the North Central States. In fact, in the towns of 5,000 to 25,000 the plants have twice as many town patrons in the Western States as those in the North Central region. This may be due to a number of factors, among which are: (1) The difference in the size of plants (see table 2); (2) the possible greater improvement in quality of meat obtained through lockers; (3) the greater use of lockers in this area for fruits and vegetables, combined with the fact that housewives can obtain fruits more easily from local growers in the Western States than in the North Central States; and (4) locker rental rates in the Western States (see table 17) are lower than in the North Central States. The latter factor is particularly important in the cost of storing fruits and vegetables which can be replaced only once a year.

TABLE 11. - AVERAGE NUMBER OF TOWN PATRONS PER LOCKER PLANT, ANALYZED BY REGION AND SIZE OF TOWN

Population of town	Average number of town patrons per plant in					
	North Central States	Western States	South Central States	North Atlantic States	South Atlantic States	United States
	<i>Number</i>					
1 - 499	19	24	20	28	-	21
500 - 999	26	45	29	78	14	30
1,000 - 1,999	34	60	67	22	-	42
2,000 - 4,999	52	78	58	122	151	61
5,000 - 9,999	61	89	61	39	38	64
10,000 - 24,999	73	160	122	172	61	104
25,000 and Over	146	195	145	169	136	158
Average.....	45	73	80	107	83	55



## SIZE OF TOWNS IN WHICH PLANTS ARE LOCATED

Frozen food locker plants thus far are located, to a large extent, in the small rural towns. As demonstrated in table 12, in the United States as a whole 16.2 percent of the plants are in towns with less than 500 population. Furthermore, 72 percent of all plants are in towns with less than 5,000 population, while only 6.8 percent of the plants are in towns of more than 25,000 population.

There is, however, a marked difference between regions. As shown in table 12, in the North Central and Western regions the percentage of all plants in towns of less than 5,000 population is 75.3 and 74.2, respectively, whereas in the less developed South Central and North Atlantic regions only 44.7 and 48.6 percent, respectively, of the plants are in towns of less than 5,000 population. Thus, in the newer areas of development, the plants are located in the larger towns.

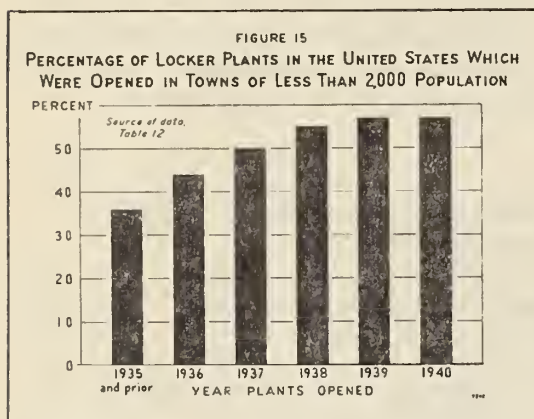
TABLE 12. - PERCENTAGE OF LOCKER PLANTS OPERATING IN EACH REGION IN TOWNS OF SPECIFIED POPULATION

Population of town	North Central States	Western States	South Central States	North Atlantic States	South Atlantic States	United States
	<i>Percent</i>					
1 - 499	17.1	18.7	2.6	8.6	-	16.2
500 - 999	20.4	15.8	3.5	5.7	10.0	17.7
1,000 - 1,999	20.0	19.5	11.4	11.4	-	19.0
2,000 - 4,999	17.8	20.2	27.2	22.9	10.0	19.1
5,000 - 9,999	11.6	8.2	23.7	17.1	20.0	11.7
10,000 - 24,999	7.8	9.4	20.2	22.9	30.0	9.5
25,000 and over	5.3	8.2	11.4	11.4	30.0	6.8
Total.....	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 13. - PERCENTAGE OF LOCKER PLANTS OPENED DURING EACH OF THE PAST 5 YEARS AND ALL PRIOR YEARS IN TOWNS OF SPECIFIED POPULATION

Population of town	1935 and prior	1936	1937	1938	1939	1940	All years
	<i>Percent</i>						
1 - 499	11.7	17.3	13.2	14.6	17.5	19.5	16.2
500 - 999	8.8	8.0	19.1	18.5	20.3	19.5	17.7
1,000 - 1,999	15.8	18.4	17.7	22.2	19.6	17.8	19.0
2,000 - 4,999	18.7	26.4	24.1	19.4	16.5	17.4	19.1
5,000 - 9,999	14.6	6.9	11.4	11.6	9.6	13.8	11.7
10,000 - 24,999	17.0	13.8	8.6	7.3	9.4	8.0	9.5
25,000 and over	13.4	9.2	5.9	6.4	7.1	4.0	6.8
All sizes....	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Average size of towns.....	11,776	8,833	6,603	6,524	6,987	5,501	7,054

In table 13 the locker plant location by size of town and year opened tends to bear out the fact that the earlier developments in each area have been, to a large extent, in the larger towns. Thus, of the plants opened during 1935 and prior, 55 percent were in towns of less than 5,000 population whereas 74.2 percent of the plants opened during 1940 were in towns of less than 5,000 population.



In table 14 the data on size of town by year opened are analyzed for the North Central region only. These data eliminate regional variations in the size of town and, therefore, permit closer examination of trends in the development. It appears from this analysis that the actual number as well

as the percentage of all plants opened in the North Central region has been increasing in the towns of less than 1,000 population. Thus during the last 3 years 1938, 1939, and 1940, the number of plants opened in towns of less than 500 population was 40, 54, and 63, respectively, while as a percentage of all plants opened in the region they increased from 16.5 to 22.8.

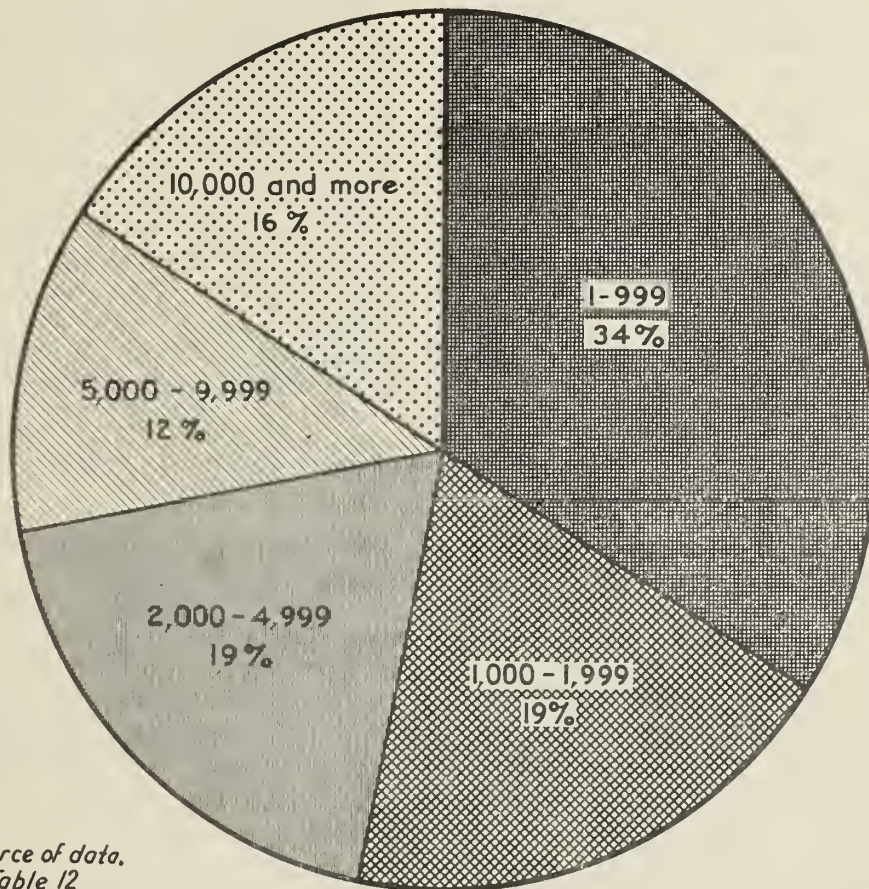
It seems doubtful, however, that the increasing number and percentage of plants opened in small towns justifies the large number of small units of 100 to 250 locker capacity that are being installed. Assuming the trade territory of the average shopping center covers a radius of 6 miles and that farms have an average of 160 acres, there would be a total of about 450 farm families in the trade area. Assuming that a town of 500 has approximately 125 families, the community has a total of 575 families from which to draw its patronage. If 40 percent of the families in such communities were to use lockers (see fig. 18) the total users would be about 230 patrons, who would use in the neighborhood of 275 to 300 lockers. Thus, it is not entirely correct to assume that the limited demand of the small communities accounts for the large number of small units installed during the past 3 years.

TABLE 14. - NUMBER AND PERCENTAGE OF LOCKER PLANTS IN THE NORTH CENTRAL REGION WHICH WERE OPENED DURING EACH OF THE PAST 5 YEARS AND ALL PRIOR YEARS IN TOWNS OF SPECIFIED POPULATION

Population of town	Number and percentage of locker plants opened in													
	1935 and prior		1936		1937		1938		1939		1940		All plants	
	No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent	No.	Per-cent
1 - 499	3	5.5	5	10.2	15	9.5	40	16.5	54	19.9	63	22.8	180	17.1
500 - 999	3	5.6	4	8.2	30	19.0	50	20.6	63	23.2	65	23.6	215	20.4
1,000 - 1,999	8	14.8	6	12.3	29	18.4	58	23.9	58	21.3	51	18.5	210	20.0
2,000 - 4,999	10	18.5	16	32.7	43	27.2	43	17.7	36	13.2	39	14.1	187	17.8
5,000 - 9,999	11	20.4	6	12.2	19	12.0	23	9.4	28	10.3	35	12.7	122	11.6
10,000 - 24,999	12	22.2	6	12.2	15	9.5	17	7.0	16	5.9	16	5.8	82	7.8
25,000 and over	7	13.0	6	12.2	7	4.4	12	4.9	17	6.2	7	2.5	56	5.3
All sizes	54	100.0	49	100.0	158	100.0	243	100.0	272	100.0	276	100.0	1,052	100.0

Figure 16

# PERCENTAGE OF LOCKER PLANTS OPERATING IN TOWNS OF SPECIFIED SIZES



Source of data,  
Table 12

19848-8

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## PROCESSING SERVICES

In table 15 the data on the number of all plants reported as furnishing each of the more important meat processing services are analyzed by regions. These data indicate that the percentage of all plants reporting that furnished cutting, wrapping, and freezing was highest in the area where the development is most recent and lowest in the Western States where a large number of plants were operating prior to 1936. The North Atlantic region is an exception to this rule; however, this is largely because a relatively large number of ice and cold storage plants in New York and Pennsylvania operate only a locker room as a side line to their major enterprise.

The percentage of all plants which provide grinding service is highest in the South Central States and, as might be expected, it is lowest in the North Atlantic States. Curing is most prevalent in the plants reporting from the South Atlantic States, with two-thirds of the plants reported as rendering the service, and least prevalent in the North Atlantic States where 8 percent or only 3 out of 37 plants reported curing. The same situation prevails as far as smoking service is concerned. However, the data indicate that not all plants which cured meats in the South provided smoking service.

Only 29.3 percent of the 1,781 plants reporting in the United States as

TABLE 15. - NUMBER AND PERCENTAGE OF LOCKER PLANTS PROVIDING MAJOR PROCESSING SERVICES, ANALYZED BY REGIONS

Region	Total number of plants reporting <sup>1</sup>	Processing services											
		Cut, wrap, and freeze		Cut, wrap, freeze, and grind		Grind		Cure		Smoke		Render lard	
		Number	Percent of total	Number	Percent of total	Number	Percent of total	Number	Percent of total	Number	Percent of total	Number	Percent of total
North Central States	1,142	855	74.9	116	10.2	786	68.8	486	42.6	470	41.2	394	34.5
Western States.....	464	332	71.6	30	6.5	278	59.9	131	28.2	117	25.2	78	16.8
South Central States	125	109	87.2	7	5.6	104	83.2	74	59.2	55	44.0	42	33.6
North Atlantic States	37	18	48.6	3	8.1	14	37.8	3	8.1	3	8.1	4	10.8
South Atlantic States	13	11	84.6	1	7.7	10	76.9	9	69.2	7	53.8	4	30.8
United States...	1,781	1,325	74.4	157	8.8	1,192	66.9	703	39.5	652	36.6	522	29.3

<sup>1</sup>Includes all plants reporting in the 1941 survey.

The plants which reported a charge including grinding, as well as cutting, wrapping, and chilling, are relatively few. Note that in table 15 the plants which reported a combined charge for cutting and grinding were segregated from those which made a separate charge for each of these services. Thus, in interpreting the total number and percentage of plants which rendered these services, the two figures should be combined.

a whole rendered lard. The North Central States with 34.5 percent had the highest percentage, with only 10.8 in the North Atlantic States furnishing this service.

Table 16 presents the data on the percentage of all plants reporting that rendered services other than those analyzed in table 15. This group of services includes those for which rates were not assembled. Incidentally, the reason for lack of rate information (see

table 17) and, hence, rate analysis for this group of services is a result of the wide variation in the type of service rendered. To illustrate, a comparison of rates for making sausage would be meaningless because in some plants the sausage is merely seasoned whereas in others it may be stuffed into casings, and in some cases smoked. To a greater or lesser degree, this is true of all these services. Hence, without a greater breakdown in the reports an analysis of these rates is useless.

Approximately one-half of the plants reporting indicated they did slaughtering on the farm or at the plant. This should not be interpreted as meaning that these plants slaughtered all the local livestock processed in the plant, for studies indicate that there is considerable variation from one plant to another in the percentage of farm carcasses dressed by the plant. The North Central States have the highest percentage of plants that slaughter while the North Atlantic States have the lowest. This difference may be accounted for in part by factors such as the smaller size of towns in which plants are located and, what is probably more important, the greater use of home-grown animals.

Poultry dressing, on the other hand, is most prevalent in the South Atlantic and South Central States with more than half of the plants reporting this service. This may be attributed to the greater use and emphasis on home-grown poultry as a source of meats. This, in turn, arises from the traditional use of large amounts of poultry for the meat supply in this area.

Of the plants reporting from the South Atlantic States, 84.6 percent make sausage in one form or another whereas only 34 percent of the North Atlantic plants perform this service. The difference is probably due to eating habits or to the greater use of this type of meat in southern menus.

The South Central and South Atlantic States also report a higher percentage of plants that scalded and packaged vegetables for patrons. This probably results from their attempt to induce greater use of lockers for vegetable and fruit storage. The greater prevalence of this service in the South seems contrary to what might be expected in that the northern patrons cannot have the winter gardens, which make available some green vegetables throughout most of the year in the South. It is also of

TABLE 16. - PERCENTAGE OF PLANTS PROVIDING OTHER PROCESSING SERVICES, ANALYZED BY REGIONS<sup>1</sup>

Region	Percentage of plants which					
	Slaughter <sup>2</sup>	Dress poultry	Make sausage	Scald vegetables	Package fruit and vegetables	Other
	<i>Percent</i>					
North Central.....	64.9	47.5	55.4	12.8	37.0	21.1
Western.....	29.5	19.5	46.5	4.5	13.0	10.7
South Central.....	41.9	53.7	81.0	36.7	61.7	34.7
North Atlantic.....	20.7	28.6	34.3	8.6	28.6	17.1
South Atlantic.....	25.0	53.8	84.6	38.5	61.5	53.8
Average.....	53.3	40.5	54.7	12.6	32.7	19.6

<sup>1</sup>Percentages based on the total of all plants which reported they did or did not render service; plants making no report excluded.

<sup>2</sup>Combined reports of all plants slaughtering either at plant or on farm.



interest to note that the Western States report the smallest percentage of plants performing vegetable scalding as well as fruit and vegetable packaging service in that the plants in this area store more home-grown fruits and vegetables than those in any other area (see table 19).

In general, the data on miscellaneous services rendered in locker

plants display a number of regional differences which cannot be explained on the basis of demand or need. This indicates that there is some lack of economic planning in the construction and operating policies of existing locker plants which should be given serious consideration by those interested in the sound development of this industry.

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## LOCKER RENTAL AND PROCESSING RATES

The charges made by locker plants for processing and locker rentals vary a great deal from one area to another. With some services, this results from a difference in the type or quality of service rendered. As indicated in the section on processing services rendered, the variation in the kind of service makes general comparisons useless in the case of such services as sausage making and fruit and vegetable processing. Hence, the rates for these services are not included in the analysis. In fact, from one plant to another the quality or kind of service furnished may vary materially even for those for which rates were assembled. These variations will be pointed out in each case.

### *Average Rates, by States.*

The average locker rental rates shown by States in the first column of table 17 were arrived at by computing an average of the various rates charged for each tier of lockers and the different type of lockers in each plant reporting. These averages were used in computing the rates by States. This comparison of rates by States may be misleading in that the average size of lockers in one State may be quite different from that in another. Thus, in the States of Washington and Oregon, many plants have wooden lockers which may have a capacity ranging from 6 to 14 cubic feet, whereas the size of the modern steel locker most generally used is 5.9 cubic feet (outside dimensions). Furthermore, many plants use a larger than average steel locker which occupies approximately 7 cubic feet. Of course, it is generally conceded that the modern steel locker affords better protection than most wooden lockers in use today. These differences must be considered when weighing the significance of rental rate variations.

The plants in the Western States, reporting an average of \$8.44, have the lowest average annual locker rental rate of any region. This fact is even more significant because, as indicated above, the homemade lockers most prevalent in this area are usually much larger than the modern steel locker used generally in other regions. In the South Atlantic States the average locker rental rate of \$11.85 is \$3.41 higher than the rate used in the Western States and \$2.09 above the average of \$9.76 for the United States as a whole.

On an individual State basis, it will be noted that annual locker rental rates are lowest in New York, with an average of \$6.17 per locker in the 9 plants reporting. Washington, Oregon, Idaho, Wisconsin, Kansas, and Nebraska follow in that order with rates lower than \$9.25 per locker. Georgia has the highest rate with one plant reporting an average of \$13.50, while Maryland, South Carolina, Arizona, and Wyoming follow in that order with average rates higher than \$12.

It would appear that this difference in rates may be correlated with the age of the development. Thus, the areas which have been developed during the past 2 or 3 years have the higher rates. This, in turn, may be attributed to a number of factors including the change in the type of plants opened and the attitude that it is easier to lower rates than raise them.

The average charge for chilling, cutting, wrapping, and freezing was computed by using the plants reporting this method of charging for service. This excludes those which used a rate which covered grinding as well. The

Figure 17  
Average Annual Locker Rental Rates Charged by  
Locker Plants Reporting

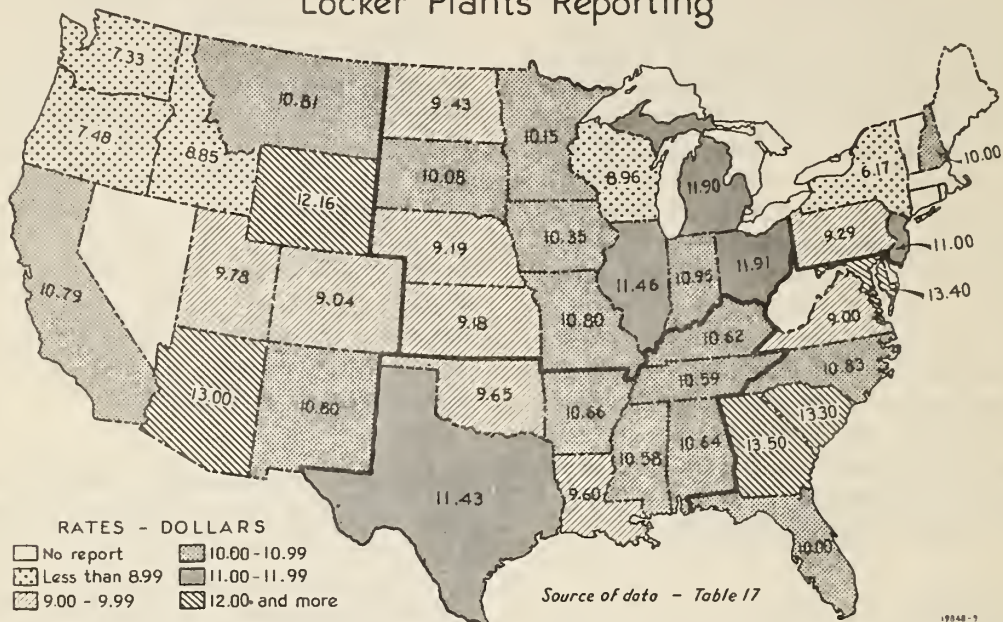
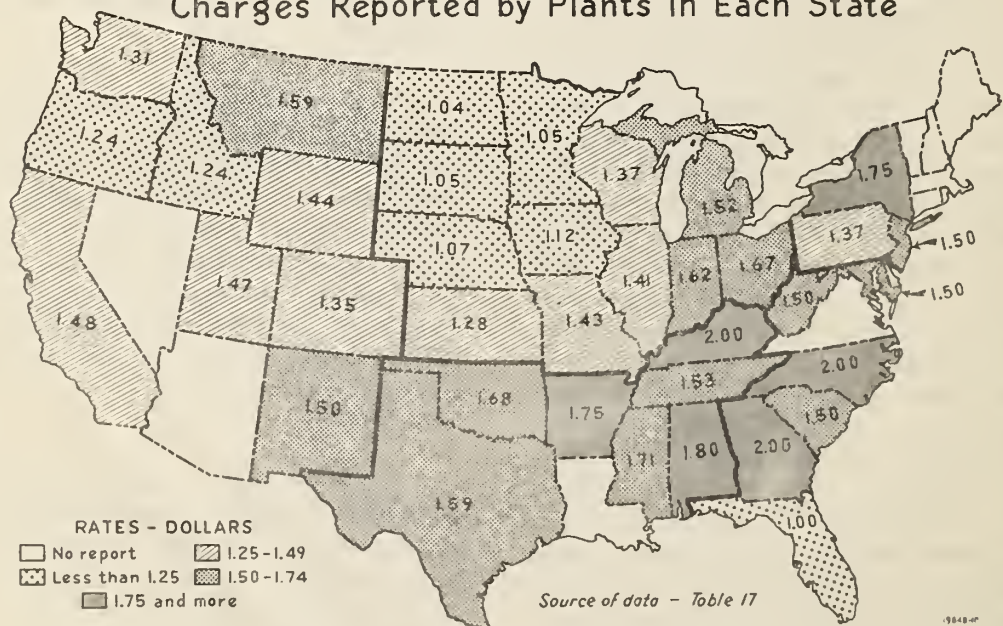


Figure 18  
Average Chilling, Cutting, Wrapping, and Freezing  
Charges Reported by Plants in Each State





plants in the North Central States, with the average charge of \$1.24 per 100 pounds, have the lowest rate for chilling, cutting, wrapping, and freezing meat; while those reporting from the South Atlantic States, with an average of \$1.64, have the highest rate. The latter is 34 cents above the average for the United States as a whole.

The State of North Dakota with an average of \$1.04 has the lowest average rate, while South Dakota, Minnesota, Nebraska, Iowa, Oregon, Idaho, and Kansas have rates ranging from \$1.05 to \$1.28 per 100 pounds. The States of Georgia, North Carolina, and Kentucky, with rates of \$2 per 100 pounds, are highest, with Alabama, New York, Arkansas and Mississippi following in that order with rates from \$1.71 to \$1.80 per 100 pounds.

Here again the rates are lowest in the States where the plants rendering complete service are oldest. Thus, although the Western States have the oldest locker plants, the earlier plants in this area did not provide chilling, cutting, wrapping, and sharp freezing service. The early development of this type of locker plant service on an extensive basis came in the North Central States of Iowa, Minnesota, South Dakota, and Illinois during 1934, 1935, and 1936. The low rates used in these earlier plants resulted, in a large measure, from the fact that the pioneers in this type of operation used this means to encourage patrons to use this service rather than render it for themselves. Public opinion and competition forced the newer plants in surrounding communities to use similar rates. As a result of this situation, the rates in many plants are below the cost of rendering the service. Another factor contributing to lower rate levels in many areas is the fact that some operators use lockers as a means of attracting patronage to the parent organization.

Although the grinding charge of 1 cent per pound has probably been the most universal rate used for any service, the data in table 17 indicate that in many of the more recently developed areas this rate is being raised. Thus, in Kansas, Nebraska, South Dakota, Iowa, Minnesota, Illinois, and Wisconsin, this rate ranged between 97 cents and \$1.07 per 100 pounds while in Ohio, Michigan, Montana, Wyoming, California, and Mississippi, the average grinding rates vary from \$1.35 to \$1.60 per 100 pounds. The rates in the few New York plants and the one Georgia plant reporting are even higher. Such high rates are questionable for although they may be necessary to cover costs in the plant serving a small number of customers, they tend to drive farmers to home processing and thus, in turn, limit the possibilities for volume and lower costs. This, of course, is true of any rate that is excessive.

The rates for smoking average highest in the Western States and lowest in the South Atlantic region. As between States within regions, the rates charged for this service vary widely. Thus, the Alabama plants reporting charged an average of 91 cents per 100 pounds for smoking while the Tennessee plants reported an average charge of \$2.67 per 100 pounds. Similar differences are reported from the Western States with the one Arizona plant reporting a charge of \$3 per 100 pounds for smoking, and the 22 plants reporting from Utah having an average rate of \$2.06 for this service. Those plants charging the higher rates are not likely to obtain the volume necessary for efficient and, hence, low-cost smoking service.

The rates for curing pork are apparently well established at levels between 2 and 3 cents per pound. It is of interest to note that the rates for this service average highest in the Western States where rental rates are lowest, and lowest in the South Central States which



TABLE 17. - AVERAGE LOCKER RENTAL AND PROCESSING RATES, ANALYZED BY STATES

State	Average locker rental rate	Processing services				
		Chill, cut, wrap, and freeze	Grind	Cure	Smoke	Render lard
	Per year	Per cwt.	Per cwt.	Per cwt.	Per cwt.	Per cwt.
Ohio.....	\$11.91	\$1.67	\$1.41	\$2.69	\$1.28	\$1.93
Indiana.....	10.95	1.62	1.10	2.48	1.19	1.92
Illinois.....	11.46	1.41	.98	2.88	1.49	2.31
Michigan.....	11.90	1.52	1.35	2.27	1.28	2.62
Wisconsin.....	8.96	1.37	1.07	2.32	1.46	2.43
Minnesota.....	10.15	1.05	1.04	2.71	1.36	2.32
Iowa.....	10.35	1.12	1.03	2.68	1.36	1.88
Missouri.....	10.80	1.43	1.08	2.44	1.28	2.00
North Dakota.....	9.43	1.04	1.18	2.65	1.47	1.69
South Dakota.....	10.08	1.05	1.02	2.50	1.52	1.77
Nebraska.....	9.19	1.07	.97	2.40	1.25	1.80
Kansas.....	9.18	1.28	1.00	2.39	.89	1.95
North Central States..	\$10.18	\$1.24	\$1.06	\$2.60	\$1.37	\$2.12
Montana.....	\$10.81	\$1.59	\$1.40	\$2.93	\$1.62	\$2.20
Idaho.....	8.85	1.24	1.28	2.58	1.12	2.07
Wyoming.....	12.16	1.44	1.60	2.33	1.00	3.00
Colorado.....	9.04	1.35	1.05	2.44	1.50	2.02
New Mexico.....	10.80	1.50	1.00	2.00	1.00	3.00
Arizona.....	13.00	-	-	3.00	3.00	3.00
Utah.....	9.78	1.47	1.24	2.75	2.06	2.33
Washington.....	7.33	1.31	1.18	2.73	1.67	1.65
Oregon.....	7.48	1.24	1.10	2.72	1.34	1.55
California.....	10.79	1.48	1.53	2.88	2.04	3.17
Western States.....	\$ 8.44	\$1.33	\$1.22	\$2.70	\$1.57	\$1.94
Kentucky.....	\$10.62	\$2.00	\$1.00	\$3.00	\$2.00	\$ -
Tennessee.....	10.59	1.53	1.18	2.80	2.67	2.25
Alabama.....	10.64	1.80	1.00	2.00	.91	1.33
Mississippi.....	10.58	1.71	1.43	2.25	1.17	2.50
Arkansas.....	10.66	1.75	1.06	2.46	.92	1.00
Louisiana.....	9.60	-	-	3.50	-	-
Oklahoma.....	9.65	1.68	1.17	2.64	1.17	2.31
Texas.....	11.43	1.59	1.11	2.21	1.38	2.18
South Central States..	\$10.63	\$1.64	\$1.14	\$2.34	\$1.28	\$2.15
Vermont.....	\$10.00	\$ -	\$ -	\$ -	\$ -	\$ -
New York.....	6.17	1.75	2.00	-	-	-
New Jersey.....	11.00	1.50	.50	-	-	-
Pennsylvania.....	9.29	1.37	1.06	3.00	1.50	2.25
North Atlantic States.	\$ 8.61	\$1.42	\$1.08	\$3.00	\$1.50	\$2.25
West Virginia.....	\$ -	\$1.50	\$1.00	\$ -	\$ -	\$ -
Maryland.....	13.40	1.50	1.17	2.75	1.25	3.00
Virginia.....	9.00	-	-	-	-	-
North Carolina.....	10.83	2.00	1.00	2.33	.85	-
South Carolina.....	13.30	1.50	1.00	2.50	1.00	3.00
Georgia.....	13.50	2.00	3.00	2.50	1.00	3.00
Florida.....	10.00	1.00	-	2.00	1.50	-
South Atlantic States.	\$11.85	\$1.64	\$1.25	\$2.44	\$1.10	\$3.00
United States.....	\$ 9.76	\$1.30	\$1.11	\$2.59	\$1.39	\$2.10

have relatively high rental rates. This peculiarity in rate differences is probably because custom curing has been done in large volume in the Southeastern States as a side line to ice plant operation. In some cases, it was probably done merely as a good-will service. On

the other hand, volume and, hence, low-cost operation in these States have enabled operators to use lower rates. In the Western States the service is a relatively recent addition to the services rendered for farmers by locker plants.

States reporting the highest average rate for curing service are Louisiana, Pennsylvania, Kentucky, and Maryland with charges of \$3.50, \$3, \$3, and \$2.75 per 100 pounds, respectively. The States with lowest average rates are Florida, Alabama, New Mexico, Texas, and Mississippi with rates of \$2, \$2, \$2, \$2.21, and \$2.25 per 100 pounds, respectively.

The charge in many plants for rendering lard includes grinding. To the extent that plants charged in this way, the reports are in error. The data in table 17 indicate that the charge for this service varies widely as among States and regions. The Western States report the lowest average charge for this service, which is peculiar in that they have a high rate for other services. This low average is due largely to the low rates reported by plants in Oregon and Washington, which make up a relatively large proportion of all plants reporting from the Western region. Rates are highest in the plants reporting from the North and South Atlantic States.

On a State basis, the rates per 100 pounds for lard rendering range from a low of \$1 in Arkansas, \$1.33 in Alabama, and \$1.55 in Oregon plants to a high of \$3 in Wyoming, New Mexico, Maryland, South Carolina, and Georgia and \$3.17 in California.

#### *Percentage of Plants Charging Specified Rates.*

In table 18 the plants in each region which rendered each service are grouped according to the rates charged. These data indicate that slightly more than half of the plants in the North Central States charged exactly \$1 per 100 pounds for chilling, cutting, wrapping, and freezing while slightly more than one-third charged \$1.50. The reverse is true in the Western States with one-half charging \$1.50 and one-third \$1. In the South Central States approximately 57 percent charged \$1.50 and one-third charged between \$1.75 and \$2.25.

More than half of the 157 plants in the United States which reported a charge that included grinding as well as chilling, cutting, wrapping, and freezing used a rate of \$1.50 per 100 pounds. Again the South Central and North Atlantic States report a larger percentage charging the higher rate of \$1.75 to \$2.25 for this service. As indicated in table 17, \$1 per 100 pounds is by far the most usual rate for grinding in the United States. In fact, this is true for all regions except the North Atlantic, where 50 percent of the plants reporting charged less than \$1 for this service.

Of the 703 plants that reported curing rates, 45.7 percent used a rate of \$3 per 100 pounds. The next most common rate was \$2. Half of the plants charged \$1 for smoking while 21.9 percent charged \$1.50. These proportions were very similar for all regions. Of all the plants that rendered lard, 37 percent charged \$2.50 to \$3.75 per 100 pounds, 34.3 percent charged \$1.75 to \$2.25, and 18.4 percent charged only \$1.

Although differences in normal temperatures, in the cost of power, construction, and labor, and in the potential volume of business that can be expected from the patrons within a reasonable radius of locker plants may justify some of the variations in the charge for services between regions, there is little question but what the variations reported cannot be justified entirely on this basis. It would seem that the variations resulted more from chance and tradition rather than from any detailed analysis of current and probable costs.

If the industry is going to be successful in obtaining for itself its rightful place in the food preservation system, it will be necessary for it to apply rates which will enable the average locker plant to make a reasonable return on the investment involved in furnishing each of the services and yet meet the competition of retailers, farm processing, and other methods of food

TABLE 18. - PERCENTAGE OF LOCKER PLANTS CHARGING SPECIFIED RATES FOR PROCESSING SERVICES, ANALYZED BY REGIONS

Service and Rate	North Central States	Western States	South Central States	North Atlantic States	South Atlantic States	United States
<i>Cents per pound</i>	<i>Percent</i>					
<i>Cut, wrap, and freeze:</i>						
Less than 1	2.9	2.7	-	5.5	-	2.6
1	50.6	32.9	8.3	16.7	9.1	41.9
1-1/4	4.6	7.5	-	-	-	4.8
1-1/2	36.6	50.3	56.9	66.7	54.5	42.3
1-3/4 to 2-1/4	4.8	5.4	33.9	11.1	36.4	7.7
2-1/2 to 3-3/4	0.5	1.2	0.9	-	-	0.7
4 and over	-	-	-	-	-	-
Total	100.0	100.0	100.0	100.0	100.0	100.0
<i>Cut, wrap, grind, and freeze:</i>						
Less than 1	1.7	-	14.3	-	-	1.9
1	26.7	10.0	-	33.3	-	22.3
1-1/4	5.2	3.3	-	-	-	4.5
1-1/2	56.0	56.7	28.6	-	-	53.5
1-3/4 to 2-1/4	9.5	30.0	42.8	66.7	-	15.9
2-1/2 to 3-3/4	0.9	-	14.3	-	100.0	1.9
4 and over	-	-	-	-	-	-
Total	100.0	100.0	100.0	100.0	100.0	100.0
<i>Grind:</i>						
Less than 1	8.4	7.2	5.8	50.0	-	8.3
1	79.5	64.4	74.0	21.4	80.0	74.8
1-1/4	0.1	0.7	-	-	-	0.3
1-1/2	4.6	10.5	8.6	7.1	10.0	6.4
1-3/4 to 2-1/4	6.6	14.0	10.6	7.2	-	8.6
2-1/2 to 3-3/4	0.8	3.2	1.0	14.3	10.0	1.6
4 and over	-	-	-	-	-	-
Total	100.0	100.0	100.0	100.0	100.0	100.0
<i>Cure:</i>						
Less than 1	1.0	-	-	-	-	0.7
1	3.5	2.3	2.7	-	-	3.1
1-1/4	-	-	-	-	-	-
1-1/2	7.0	6.1	8.1	-	-	6.8
1-3/4 to 2-1/4	31.7	26.0	45.9	-	55.6	32.3
2 1/2 to 3-3/4	43.6	55.7	39.2	100.0	44.4	45.7
4 and over	13.2	9.9	4.1	-	-	11.4
Total	100.0	100.0	100.0	100.0	100.0	100.0
<i>Smoke:</i>						
Less than 1	2.8	3.4	16.4	-	14.3	4.1
1	53.6	43.6	49.1	33.4	57.1	51.4
1-1/4	0.4	0.8	-	-	-	0.5
1-1/2	23.6	20.5	9.1	33.3	28.6	21.9
1-3/4 to 2-1/4	15.3	21.4	20.0	33.3	-	16.7
2-1/2 to 3-3/4	2.4	6.0	3.6	-	-	3.1
4 and over	1.9	4.3	1.8	-	-	2.3
Total	100.0	100.0	100.0	100.0	100.0	100.0
<i>Render Lard:</i>						
Less than 1	2.0	3.8	-	-	-	2.1
1	17.5	24.4	16.7	25.0	-	18.4
1-1/4	0.3	-	-	-	-	0.2
1-1/2	6.1	10.2	4.7	-	-	6.5
1-3/4 to 2-1/4	35.0	30.8	38.1	25.0	-	34.3
2-1/2 to 3-3/4	37.6	28.2	40.5	50.0	100.0	37.0
4 and over	1.5	2.6	-	-	-	1.5
Total	100.0	100.0	100.0	100.0	100.0	100.0



processing and distribution. Any rates which are below costs are likely to result in a lowered quality of service or a tendency on the part of individual operators to minimize this particular service. Thus, a chilling, cutting, wrapping, and freezing charge which is too low may cause operators to neglect this aspect of the service and over-emphasize sales or locker rentals, which enable them to recoup losses.

On the other hand, high rates, such as in locker rentals, are likely to cause locker operators to emphasize this aspect of locker service at the expense of certain processing services, and the high rates and overemphasis may cause many

families to use other methods for preserving their food supply. An illustration of this is the fact that excessively high locker rentals may limit the use of lockers for fruits and vegetables. In this type of product, any one variety can be replaced only once a year from local supplies. Hence, storage or locker rental per pound is an important cost factor. Further, high locker rentals and unprofitable processing rates work to the disadvantage of small families and to the advantage of large families. Such inequities definitely limit the extent to which locker plants may serve the total potential patronage in a given community.

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## VOLUME OF SALES, CURING, AND FRUIT AND VEGETABLE PROCESSING

In table 19 the reports on the amount of pork cured, fruits and vegetables processed, and the sale of commercial fruits and vegetables, fish and sea foods, and packer beef and pork are analyzed. The first section of this table indicates the percentage of all plants which reported the amount of processing and sales. Aside from the fact that these percentages show the size of the group reporting on these questions, they demonstrate the regional differences in the percentage of plants that handle commercially frozen products as well as packer meats. Apparently more of the plants in the South and East are engaged in the sale of commercially frozen fruits and vegetables than those in the North Central or Western States. This is probably due to the difference in the size of towns in which the plants are located as well as the difference

in the emphasis on urban versus farmer patronage. The relatively large percentage of all plants in the North Central States selling commercial sea foods seems logical in that the locker system has made feasible the distribution of fresh frozen fish and sea foods in many small midwestern towns where these products are not otherwise available in comparable form. Incidentally, midwestern locker plants should provide an economical and, hence, a greatly expanded outlet for such foods during the years to come.

High quality beef is another product which may be demanded in increasing quantities in those areas where such beef is not produced locally. The locker patron by purchasing quarters or sides of beef through the locker operator can obtain any quality desired whereas the

TABLE 19. - VOLUME OF SALES, CURING, AND FRUIT AND VEGETABLE PROCESSING

A. Percentage of all plants which reported amount of specified product sold or processed						
Region	Pork cured	Local fruits and vegetables processed	Commercial		Packer beef sold	Packer pork sold
			Fruits and vegetables sold	Fish and seafoods sold		
	Percent					
North Central.....	34.7	30.1	16.1	24.6	38.9	21.4
Western.....	22.7	9.0	9.5	9.9	20.5	14.6
South Central.. . .	50.0	37.9	23.4	30.6	41.1	23.4
North Atlantic.....	13.5	24.3	27.0	16.2	29.7	16.2
South Atlantic.....	72.7	54.5	36.4	18.2	45.4	36.4
United States..	32.5	25.2	15.3	21.0	34.2	19.8
B. Average number of pounds per locker rented reported sold or processed						
	Pounds					
North Central.....	76	11	5	6	31	12
Western.....	52	34	18	7	40	22
South Central.....	155	15	7	8	38	15
North Atlantic.....	78	17	14	5	26	9
South Atlantic.....	220	18	4	7	73	30
United States..	81	13	8	6	33	14

retailer in the small community may find it impractical to stock more than one or two grades. On this basis it would seem reasonable to expect that many southern and eastern, and to a lesser extent Pacific Coast locker operators, would be purchasing beef. However, these data indicate that the Western States, represented largely by Washington and Oregon, reported only 20 percent of their plants handled packer beef whereas the North Central States reported 39 percent. This is probably because of the difference in the type of plant operating in these areas, particularly the lack of processing service in many western plants.

In the second section of table 19 the annual volume of sales, curing, and fruit and vegetable processing reported is analyzed on a per locker rented and regional basis. These data indicate very significant differences between regions. Thus, as might be expected, the plants reporting from the South Atlantic and South Central States cured three to four times as much meat per locker rented as the plants reporting from the other regions. The western plants processed 34 pounds of fruits and vegetables per locker rented or more than three times as many pounds as the plants in the North Central States and twice as many pounds as the plants in the South Central and South Atlantic States. Furthermore, the western plants reporting sold 18 pounds of commercially processed fruits and vegetables per locker rented, or approximately three times as much as did plants in the North Central and Southern regions. It would appear, therefore, that the relatively small percentage of plants in the Western States, reporting their volume of processing or sales of commercially frozen fruits and vegetables, processed or sold much larger quantities per patron than did the plants reporting from other regions. This may result from the fact

that a larger percentage of the western plants are in towns of more than 10,000 population.

Beef sales per locker rented averaged 73 pounds in the plants reporting from the South Atlantic States whereas the plants reporting from the North Central States sold less than half this quantity, or 31 pounds per locker rented. The Western and South Central plants sold 40 and 38 pounds, respectively. Thus, although the North Central States had a higher percentage of plants reporting packer beef sales than the Western States, the latter sold much more per locker rented. This supports the reasoning that the patrons in the Western States have a greater need for this service than those in the North Central States.

Packer pork sales per locker rented were largest in the South Atlantic States and smallest in the North Atlantic region. The western plants sold 22 pounds per locker rented or almost twice as much as the 12 pounds sold in the North Central plants. This is as might be expected for in those areas where hogs are produced on a large percentage of farms the locker plant, unless it is in a larger town, is likely to process home-grown hogs. On the other hand, the extent of commercial sales within a given area may vary greatly with the attitude of the operator toward local versus packer processed meats. Although farmers usually have the privilege of bringing in their own animals, the operator can in various ways discourage this practice in favor of commercial sales. The possibilities of profits on the sale of products to locker patrons will probably result in an increasing quantity of this type of operation in many types of plants, particularly the inefficient or small units where the ordinary processing and



locker rental rate is not likely to produce satisfactory earnings.

Further, in those communities where there is excess capacity either because the plant is too large or too many plants are operating, the resultant high costs and, hence, low earnings per unit of product processed are likely

to cause operators to turn to the sales as a means of increasing their profits per unit of product or per patron. It should be mentioned, however, that many plants should or will need to supplement the supply of home-grown products with kinds of foods not grown successfully or economically locally in order that their patrons may have variety in their frozen food locker supply.

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## BRANCH LOCKER-ROOM OPERATION

Branch locker rooms are a relatively recent innovation in the system of locker service. Thus, although two were opened at Darwin and Grove City, Minnesota, during 1936, this idea was not used extensively until 1938 and 1939. In this system, one or more locker rooms with a capacity for 50 to 250 lockers is built in the small outlying communities where the volume of business would not justify the investment in a complete unit and the employment of a competent operator. All chilling, cutting, grinding, wrapping, freezing, and other processing is done at the central plant. The wrapped and frozen packages are delivered to the branch plant once a week or as often as volume will permit economical delivery. The branches are owned by the central processing plant or by individuals or groups in the small community. Some individual is employed

to check the plant daily, otherwise there is no supervision necessary.

As may be noted in table 20, 6.9 percent of all plants reporting from the North Central region were operating one or more branches, while 5.6 percent of the 114 plants reporting from the South Central region were operating in this manner. It seems likely that this system will be used more extensively in the future, particularly in those areas where complete units have not been installed in the small outlying communities. This contention is based on the findings of studies of this type of operation in which it was found that the inconvenience of delivering the animals or carcasses to the central processing unit was more than offset by the economies in the use of equipment and personnel.

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## COMPETITION

Although the number of plants operating in the same town or within a given area is not necessarily a measure of competition, it does provide a clue to the competitive situation in this industry. In table 20 it may be noted that 37.9 percent of the 416 plants reporting from the Western region had one or more other plants operating in the same town. When it is recalled that 75 percent of the plants in this region are in towns of less than 5,000 population, this figure takes on added significance. Further, 66 percent of the plants in this region reported other plants within 15 miles, or close enough to compete for farm patronage on the fringe of the trade territory.

Of the plants reporting from the North Central region, 12.9 percent had other plants operating in the same town and 71.5 percent reported other plants operating within a radius of 15 miles. This indicates that in the North Central region there is less competition within the same town but somewhat more competition from surrounding towns.

In the South Central region where the development is as yet in its infancy, 9.7 percent of all plants reporting had competing plants in the same town while 21 percent reported other plants within a radius of 15 miles.

The fact that many towns have more than one plant and yet many communities and areas are not served at all suggests the possibility that plant location, construction, and operation may have been the result of factors other than prospective earnings from this enterprise itself. Observation in the field indicates that the installation of lockers may have been used as a means of attracting or holding patronage for the parent enterprise. Such an approach, although not necessarily harmful, may lead to unsound types of operation. This may take the form of rates which are lower than costs or the construction of units which are inconveniently located and arranged, of uneconomic size, or lacking in the flexibility necessary for expansion in size or type of services performed. Low rates and, hence, lack of earning power will discourage those who would invest in this enterprise as a business in itself. Too, uneconomic, inconvenient, and inflexible units limit the percentage of farmers in the trade territory that will use the service. These points should be borne in mind by those who are interested in the sound development of this industry.

Another source of direct competition which has concerned many operators is the individual frozen storage unit on

TABLE 20. - PERCENTAGE OF LOCKER PLANTS OPERATING BRANCH LOCKER ROOMS AND EXTENT OF COMPETITION FROM OTHER PLANTS AND HOME FROZEN STORAGE UNITS

Region	Percentage of locker plants reporting					
	Number of plants reporting	Opening branch plants	Other plants in town	Other plants within 15 miles	Sales of home frozen storage units	Patron losses due to home units
	<i>Number</i>	<i>Percent</i>				
North Central.....	1,138	6.9	12.9	71.5	8.6	2.8
Western.....	462	2.6	37.9	66.7	11.7	5.8
South Central.....	124	5.6	9.7	21.8	10.5	3.2
North Atlantic.....	37	-	21.6	54.0	2.7	-
South Atlantic.....	13	-	15.4	7.7	-	-
Total.....	1,774	5.5	19.4	66.0	9.4	3.6



the farm. As shown in table 20, 9.4 percent of the plants reporting indicated that frozen storage units had been sold in their territory; 3.6 percent of the plants, or approximately one-third of the 9.4 percent reporting the sales, indicated they had lost some patronage as a result of such sales. Here again the extent to which this development will take business from locker plants will depend on the cost, convenience, and quality of locker service. Thus, if it costs \$60 a year to own and operate an individual unit and \$20 to use a convenient and complete locker service system, only a small percentage is likely to use the individual unit. On the other

hand, if patrons find that their locker plant is either poorly located, renders unsatisfactory service, or charges excessive rates, they may decide to cut their own meat and package their own vegetables. In general, however, it would seem uneconomic for each patron to equip himself with the necessary chilling and sharp freezing capacity when he can buy these services at a convenient trading center. Further, the average individual is not going to be able to compete with the efficiency and effectiveness of competent personnel operating power equipment in a plant which does a reasonable volume of processing.



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